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MEMOIRS
OF THE
AMERICAN ENTOMOLOGICAL SOCIETY
NUMBER 10

A REVISION OF THE NORTH AMERICAN SPECIES BELONGING TO THE GENUS PEGOMYIA

(DIPTERA: MUSCIDAE)

BY

H. C. HUCKETT

PUBLISHED BY THE AMERICAN ENTOMOLOGICAL SOCIETY
AT THE ACADEMY OF NATURAL SCIENCES
PHILADELPHIA

1941

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Issued April 28, 1941

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H. C. HUCKETT
Riverhead, New York

The genus *Pegomyia* Robineau-Desvoidy was originally proposed for the reception of a small group of anthomyid flies, the larvae of which were reported as leaf-miners in certain plants. At the present, the genus stands for a large composite grouping of species, the larval habits of many of which are known to differ widely. For instance the larvae of some North American forms have been found to inhabit the burrows of rodents and land turtles, and in the case of others of wider geographical representation to feed on mushrooms and to tunnel around canes of raspberry, whilst as leaf-miners the species are known to inhabit the foliage of an increasing variety of plants, e. g., thistles, convolvulus, spinach, ragweed and dock.

The genus is widely distributed throughout the Northern Hemisphere, and the species are not uncommon in many parts of this area. Nearly one hundred species are herein recorded as occurring in North America.

The genus is not readily defined owing to the limited nature of many of the characters possessed by the species. Despite this handicap the genus serves a useful purpose in providing a common ground for the assemblage of a large number of associated groups of species. These minor segregates are frequently more easily distinguished for diagnostic purposes than the genus itself, one of

the most helpful clues to their recognition being the structure and character of the copulatory appendages in male. The genus, thus composed, impinges naturally at certain points on the boundaries of other genera belonging to the subfamily Anthomyiinae. Some species ascribed to such genera I have transferred to Pegomyia on the evidence provided by the common characters possessed by the hind tibiae as denoted by the presence of two bristles on anterodorsal and posterodorsal surfaces respectively, and in the male sex by the lack of a series of setulae on posteroventral surface. The genus may be distinguished from *Emmesomyia* Malloch and *Taeniomyia* Stein by the absence of a bristle or setulose hairs on upper border of pteropleura below the wing, and from *Paregle cinerella* (Fallén) by the absence of a wartlike tubercle on dorsal surface of second antennal segment. Malloch[1] has pointed out that there may be some pegomyian forms in North America applicable to Stein's european genus *Enneastigma*, but as yet no structural characters have been proposed that would warrant their transfer to that genus.

Synonymy

In dealing with the synonymy of palaearctic species occurring in North America I have in large measure restricted the citations to the period following the publication of Stein's[2] first monograph on the european species of Pegomyia and of the third volume of Katalog der Paläarktischen Dipteren issued during the following year.[3] More recent treatment of the synonymy may be found in Séguy's[4] comprehensive work on the Muscidae of the World issued in 1937 as a fascicle of Genera Insectorum, and in Ringdahl's[5] synoptic revision of the Swedish species of *Pegomyia* published in 1938.

[1] Malloch, J. R. A synopsis of the North American species of the genus *Pegomyia* Robineau-Desvoidy (Diptera, Anthomyiidae). *Bull. Brooklyn Ent. Soc.*, XV, pp. 121–127, 1920.

[2] Stein, P. Die mir bekannten europäischen Pegomyia-Arten. *Wien. Ent. Zeitg.*, XXV, pp. 47–107, 1906.

[3] Stein, P. Katalog der Paläarktischen Dipteren. III, pp. 700–710, 1907.

[4] Séguy, E. Genera Insectorum. fasc. 205, pp. 48–67, 1937.

[5] Ringdahl, O. Översikt av svenska Pegomyia-arter (Diptera: Muscidae). *Entomol. Tidskr.*, LIX, (hft. 3–4), pp. 190–213, 1938.

Explanation of Descriptive Terms

The distance separating the eyes is measured at narrowest part of frons: the width of parafacial is measured in profile at its greatest development near base of antennae: the height of cheek is measured below the most ventral extension of eye margin: the postgenal margin denotes the boundary between occipital and genal regions at the caudoventral angle of head: the postvertical pair of bristles is situated on the occipital region caudad of the inner pair of vertical bristles: the third antennal segment is considered yellowish proximad if the yellowish area on inner surface extends distad of a point opposite base of arista; if not, the segment may be invariably considered entirely blackish.

The pronotal setulae are situated on the planes of acrostical and dorsocentral bristles along the cephalic border of mesonotum opposite the occipital region of head: stigmatal bristles are situated below mesothoracic spiracle: apical setulae of scutellum are situated between apical pair of bristles: the anal sclerite in male forms that part of hypopygium surrounding the anal membrane: basal sclerite is situated immediately cephalad of anal sclerite: the prebasal sclerite is placed cephalad of basal sclerite and is in the male of many species obscured from view by the overlapping of tergum 5. The nomenclature of the wings is according to Comstock.[6]

Acknowledgments

I wish to acknowledge my indebtedness to all those entomologists who have kindly permitted me to use the collections in their charge as a basis for this contribution on the pegomyian fauna of North America. Among the Institutions that have thus generously helped are the Academy of Natural Sciences of Philadelphia [A. N. S. P.], United States National Museum [U. S. N. M.], Entomological Branch of the Canadian Department of Agriculture [C. N. C.], Illinois Natural History Survey [Ill. N. H. S.], New

[6] Comstock, J. H. The wings of insects. pp. 1–430, 427 figs., 1918.

England Museum of Natural History [N. E. M. N. H.], Field Museum of Natural History, Cornell University [C. U.], American Museum of Natural History [A. M. N. H.], Carnegie Museum and Ohio State Museum. Material has also been submitted for study from the collections of Brigham Young University, Colorado State College, Macdonald College, Quebec, Michigan State College, Oklahoma Agricultural and Mechanical College, Oregon State College, South Dakota State College, Texas Agricultural and Mechanical College, Utah Agricultural College, and from the Universities of Alberta and Wisconsin. Abroad I have had the privilege of examining North American species in the collections of the British Museum of Natural History, Zoological Museum of the University of Berlin [Z. M. U. B.], Zoological Museum of the University of Copenhagen [Z. M. U. C.], 'S Rijks Museum at Leiden and Muséum National d' Histoire Naturelle. Reference to the source of such material in the following records has been included within brackets [ ], and in many instances the full name has been abbreviated to capital letters as indicated above.

I also wish to express my appreciation for the loan of material from the private collections of Dr. A. L. Melander [A. L. M.], A. J. Basinger, F. S. Blanton, G. Steyskal, F. M. Snyder, J. Wilcox, and also for the help thus given by the late Dr. J. M. Aldrich, Professor J. S. Hine and Mr. C. W. Johnson. Material retained in the author's collection is denoted by the initials [H. C. H.].

To Mr. Oscar Ringdahl I am deeply indebted for assistance and advice with regard to problems relating to the identity of pegomyian species common to the fauna of Sweden and North America.

PEGOMYIA Robineau-Desvoidy

Pegomyia Robineau-Desvoidy, Essai Myod., p. 598, 1830. Macquart, Hist. Nat. Ins., II, p. 351, 1835. Westwood, Intr. Mod. Class. Ins., Suppl., II, p. 143, 1840. Meade, Descr. List. Brit. Anth., II, p. 53, 1897. Stein, Berl. Ent. Zeitschr., (1897), XLII, p. 236–249, 286, 1898. Aldrich, Misc. Coll. Smithsn. Inst., XLVI, p. 558–559, 1905. Stein, Wien. Ent. Zeitg., XXV, p. 47–107, 1906. Stein, Kat. Paläark. Dipt., III, p. 700, 1907. Williston, Man. N. A. Dipt., 3rd ed. p. 336, 1908. Coquillett, Proc. U. S. Nat. Mus., XXXVII, p. 586, 1910. Schnabl, Hor. Soc. Ent. Ross., XXXIX, p. 105–114, 3 pls., 1910. Schnabl and Dziedzicki, Abh. K. Leop.-Carol. Deutsch. Akad. Naturforsch., XCV, nr. 2, p. 108–112, 1911. Stein, Arch. f. Naturgesch., (1913), LXXIX, (A), hft. 8, p. 33–36, 1914. Stein,

Arch. f. Naturgesch. (1915), LXXXI, (A), hft. 10, p. 13, 123–131, 221, 1916. Malloch, Trans. Amer. Ent. Soc., XLIV, p. 295, 300, 1918. Stein, Arch. f. Naturgesch., (1917), LXXXIII, (A), hft. 1, p. 148, 149, 1919. Malloch, Rept. Can. Arct. Exped., 1913–18, III, C, p. 74C, 1919. Stein, Arch. f. Naturgesch., (1918), LXXXIV, (A), hft. 9, p. 63–73, 1920. Malloch, Bull. Brooklyn Ent. Soc., XV, p. 121–127, 1920. Séguy, Faune de France, VI, p. 148–166, 1923. Huckett, Mem. 77, N. Y. (Cornell) Agr. Exp. Station, (1923), p. 40–48, 1924. Enderlein, Fauna Deutschlands, 3rd. ed., p. 341, 1925. Karl, Tierwelt Deutschlands, XIII, pt. 3, p. 122–144, 1928. Ringdahl, Entomol. Tidskr., LIV, p. 2, 1933. Curran, Fam. Gen. N. A. Dipt., p. 393, 1934. Séguy, Gen. Insect., fasc. 205, p. 48–67, 1937. Ringdahl, Entomol. Tidskr., LIX, hft. 3–4, p. 190–213, 1938.

Phoraea Robineau-Desvoidy, Essai Myod., p. 600, 1830.

Zabia Robineau-Desvoidy, Essai Myod., p. 600, 1830.

Chlorina Robineau-Desvoidy, Essai Myod., p. 602, 1830.

Anthomyia (*Pegomyia*) Strobl, Verh. K. K. zool.-bot. Ges. Wien, XLIII, p. 250–252, 1893. Pandellé, Rev. Ent. France, XX, p. 290, 1901.

Pegomyza Karl, Tierwelt Deutschlands, XIII, pt. 3, p. 121, 1928.

Chortophila (*Nudaria*) Karl, Tierwelt Deutschlands, XIII, pt. 3, p. 171, 1928.

Chortophila (*Nupedia*) Karl, Zool. Anzeiger, LXXXVI, p. 174, 1930.

GENOTYPE: *Musca hyoscyami* Panzer. (Designation of Coquillett, 1910.)

The genus *Pegomyia* was erected by Robineau-Desvoidy (1830)[7] for the reception of six nominal species, the larvae of which were recognized as leaf-miners. Of these species only the first, namely *Pegomyia hyoscyami* (Panzer), has retained its identity in the writings of subsequent authors.

Macquart (1835) enlarged the genus to include the names of sixteen nominal species, and in so doing absorbed the four subsequent remaining genera of Robineau-Desvoidy's tribal segregate Pegomydae.

Westwood (1840) selected *Anthomyia fulgens* Meigen as type of *Pegomyia*, a species evidently not represented in the original series and hence may be regarded as ineligible for type designation as defined by the Code.

No formal recognition of the genus is given in the larger works of Zetterstedt, Siebke, Schiner, Nehaus, Bigot or Rondani. The latter author split the pegomyian species into two groups, placing

[7] Refers to literature cited in the synonymy as indicated by the year of publication.

in *Anthomyia* those with slightly developed frontal head sclerites in male and prominently extended lower calyptral scale, and in *Chortophila* those with extensively molded head parts and inconspicuous lower scale.

Meade (1897) in his classification of the British Anthomyiidae broadened the concept of the genus to include flies of the subfamily Anthomyiinae with bare arista and yellowish legs, abdomen yellowish or darkened and calyptral scales of equal and unequal development. On the other hand Strobl (1893) and Pandellé (1901) maintained the group as a part of the genus *Anthomyia*.

Coquillett[8] in 1901 designated *Musca hyoscyami* Panzer as the genotype of *Pegomyia*, and later he (1910) broadened the concept of the genus to include the genera *Phorbia*, *Egle*, *Chortophila* of authors, and also other little known groups proposed by Robineau-Desvoidy and Lioy.

Schnabl (1910) and Schnabl and Dziedzicki (1911) concluded that the genus *Pegomyia* contained species which could be distinguished from those in related groups by the narrower frons in male, and that the group consisted of a number of small segregates in which the basic distinction lay in the structure of the male genitalia and copulatory appendages. The genus was divided into four subgenera, of which *Pegoplata* and *Pegomyza* were characterized as having plumose arista, *Anthomyia* with black legs, and *Pegomyia* with mostly yellowish legs. If Schnabl's classification is to be adopted the name *Anthomyia* would necessarily supercede that of *Pegomyia* for the genus owing to its priority, and as a result it would become necessary to make appropriate changes in the names applied to higher categories.

Stein (1897) (1906) (1907) (1914) in his earlier contributions restricted the genus to include species with bare or nearly bare arista, yellowish basal segments of antennae, and yellowish legs. In later years he included species with plumose arista, which, in common with many others belonging to the genus, were characterized by the possession of two antero- and two posterodorsal bristles on hind tibia.

[8] Coquillett, D. W. Types of anthomyid genera. *Journ. N. Y. Ent. Soc.*, IX, pp. 139–140, 1901.

Malloch (1918) (1920) following Stein in his treatment of the genus included allied species with black tibiae that had two posterodorsal bristles on hind tibia. None of the species in the genus possessed short erect hairs on posteroventral surface of hind tibia in male. This concept of the genus included many species belonging to *Chortophila* and *Phorbia* of authors, *Eremomyia* Stein (1920), and more recently *Nupedia* Karl (1930).

Séguy (1923) in his treatment of the French fauna utilized to a large degree the classification erected by Schnabl. The so-called Pegomyinae were restricted to three genera, namely *Pegomyia*, *Anthomyia* and *Calythea*. The former was further subdivided into two subgenera, *Pegoplata* and *Pegomyia*. *Pegomyza* was regarded as a synonym of *Pegoplata*.

Karl (1928), in classifying the German forms, more correctly, in my opinion, maintained the tribal name Anthomyini, in which both *Pegomyza* and *Pegomyia* are given full generic rank. *Anthomyia virginea* Meigen is given as typical of *Pegomyza*, of which *Pegoplata* is mentioned as a synonym. Since the name *virginea* was not included by Schnabl and Dziedzicki (1911) in the original series under *Pegomyza* I am doubtful whether that species may be considered available for type designation unless it can be shown more conclusively that *virginea* is conspecific with one or more of the forms listed in *Pegomyza*. The group *Nupedia* (*Nudaria* preoc.) was erected by Karl (1930) for the reception of dark-legged forms as exemplified in *Anthomyia dissecta* Meigen. Stein (1916) had previously included such species in *Chortophila*.

More recently Séguy (1937) in his comprehensive monograph on the genera of the family Muscidae has largely followed Stein in his citation of the characters definnig the genus *Pegomyia*. The groups *Pegomyza* and *Pegoplata* are contained within the meaning of the genus. The type of *Pegoplata* is cited as *Pegomyia palpata* Stein, the first name given by Schnabl and Dziedzicki (1911) in the series of species belonging to the group. Stein (1916) has drawn attention to the fact that the species was misnamed by Schnabl, the proper name for which should have been *Hydrophoria palposa* Stein, a species closely allied to *virginea* Meigen. Since *palpata* and *palposa* represent widely separated groups of species

within the genus the character and relationship of the group *Pegoplata* will depend largely on the decision concerning which species may be accepted as the valid type.

Ringdahl (1938) in his review of the Swedish species has divided the genus *Pegomyia* into eight subgenera, namely *Pegomyza* with type *Anthomyia praepotens* Wiedemann, *Pegoplata* with type *Anthomyia virginea* Meigen, *Arctopegomyia* Ringdahl with type *Anthomyza tunicata* Zetterstedt, *Chaetopegomyia* Ringdahl with type *Anthomyia setaria* Meigen, *Emmesomyia* Malloch with type *E. unica* Malloch, *Phoraea* R.-D. with type *Anthomyia silacea* Meigen, *Pegomyia* R.-D. with type *Musca hyoscyami* Panzer and *Pegomyiella* Ringdahl with type *Anthomyza lunatifrons* Zetterstedt. All these groups with the exception of *Emmesomyia*, which I regard as entitled to generic rank, and possibly *Phoraea*, are represented in the North American fauna as herein restricted. The true significance of such groupings in this instance however cannot be properly evaluated with any degree of accuracy for lack of the opportunity to make the necessary comparative studies.

Summary of Faunal Records

One of the earliest records extant of the capture of pegomyian flies in North America is to be found in the New England collections of William Harris. According to Johnson[9] specimens taken by Harris were submitted to Say in 1833 for identification, and among the specimens were several that had received the manuscript name *Anthomyia lenis*. Johnson, in studying the collection later, recognized two species among the material represented as *lenis*, namely *Alloeostylus diaphanus* (Wiedemann) and *Pegomyia geniculata* (Bouché).

Early references to the occurrence of pegomyian species in North America are to be found among Walker's[10] published records of 1849. Such congeneric forms as *Anthomyia lipsia* and *Eriphia flavifrons* were captured in the Hudson Bay Territory, *Coenosia substituta* from Massachusetts. The latter species was shown by

[9] Johnson, C. W. Diptera of the Harris Collection. *Proc. Boston Soc. Nat. Hist.*, XXXVIII, pp. 92–93, 1925.

[10] Walker, F. List of the specimens of dipterous insects in the collection of the British Museum, IV, pp. 928, 966, 971, 1849.

Stein[11] to be identical with *lipsia*. In 1867 van der Wulp[12] described the pegomyian species *Anthomyia tarsata* from a collection of flies taken in Wisconsin. In 1878 Meade[13] published a synopsis of the results of his examination of a collection of North American Anthomyiidae sent to him by Osten Sacken, in which amongst others he recognized specimens that reminded him of such european species as *Anthomyza gilva*, *A. vittigera* and *A. flavoscutellata* of Zetterstedt. Hagen[14] published a fuller report of the material examined by Meade when that collection had been returned by Osten Sacken to the Museum of Comparative Zoology at Cambridge. This later list included the species *Anthomyza latitarsis* Zetterstedt, a record omitted in Meade's previous communication. Osten Sacken[15] did not mention the genus *Pegomyia* in his catalogue of diptera from North America, preferring to retain the names of species as originally designated by the various authors.

In 1898 Stein[16] recorded thirteen nominal species in *Pegomyia* from the collections of Aldrich, Johnson and Nason. Of these forms I consider that *trilineata* and *trivittata* belong properly to *Hylemyia*, and *setosa* should be placed in Malloch's genus *Eremomyoides*. The remaining records consist of seven new native species and three european. Among the latter is included the species *calyptrata* (Zetterstedt), a record which in my opinion was based mistakenly on material representing another species, namely *triseta* Malloch. In 1905 Aldrich[17] following closely Stein's records cited the names of thirteen nominal species in *Pegomyia*

[11] Stein, P. Die Walker'schen aussereuropäischen Anthomyiden in der Sammlung des British Museum zu London. *Zeitschr. f. Hymen. u. Dipt.*, I, (hft. 4), p. 212, 1901.

[12] Van der Wulp, F. M. Eenige Noord-Americaansche Diptera. *Tydschr. v. Ent.*, X, p. 151, 1867.

[13] Meade, R. H. Notes on the Anthomyiidae of North America. *Ent. Month. Mag.*, XIV, pp. 250–252, (1877–1878), 1878.

[14] Hagen, H. A. List of N. American Anthomyidae, examined by R. H. Meade, Esq., Bradford, England. *Can. Ent.*, XIII, pp. 43–51, 1881.

[15] Osten Sacken, C. R. Catalogue of the described Diptera of North America. *Smithsn. Miscel. Coll.*, III, pp. 167–170, 1878.

[16] Stein, P. Nordamerikanische Anthomyiden. *Berl. Ent. Zeitschr.*, XLII, pp. 236–249, (1897), 1898.

[17] Aldrich, J. M. A catalogue of North American diptera (or two-winged flies). *Smithsn. Miscel. Coll.*, XLVI, pp. 558–559, 1905.

from North America. In this list the names *conformis* (Fallén) and *vicina* Lintner are retained for species that are identical with *hyoscyami* (Panzer). The species *Pegomyia nitidula* Coquillett I regard as allied to *Chortophila sepia* (Meigen), and hence does not belong to *Pegomyia*.

There are twenty two names of North American species of *Pegomyia* given by Stein[18] in his analytical study of the noneuropean species of Anthomyiidae. Among these names are three that are included as synonyms, three that have heretofore been included in *Hylemyia*, and one that is doubtfully retained. Among the species recorded are *Pegomyia bucculenta* Coquillett which I regard as identical with *Hylemyia brassicae* (Bouché), *Spilogaster socialis* Stein as a species of *Emmesomyia* Malloch, and *Anthomyia tarsata* (van der Wulp) which I consider a valid species although listed as a synonym of *lipsia* (Walker).

In 1920 Stein[19] published his second contribution on North American Anthomyiidae, in which is presented a key to twenty seven species and one variety of *Pegomyia*. Seven species are described as new, of which I regard *fuscinervis* as identical with *duplicata* Malloch, and *setigera* as belonging to the genus *Hylemyia*. The european names *gilva* (Zetterstedt) and *bivittata* Stein are given for species that I consider have appeared in North American literature under the names *luteola* Malloch and *lativittata* Malloch respectively. The european species *P. squamifera* Stein, which is regarded by Ringdahl as a synonym of *P. rufina* (Fallén), is recorded for the first time as occurring in North America. Stein has described three new forms under *Chortophila*, namely *glabra*, *latipalpis*, *nigroscutellata*, that I have transferred to *Pegomyia* on the strength of characters presented by the bristling on hind tibiae.

[18] Stein, P. Die Anthomyidengattungen der Welt, analytisch bearbeitet, nebst einem kritisch-systematischen Verzeichnis aller aussereuropäischen Arten. *Arch. f. Naturgesch.*, LXXXIII, (A), hft. 1, pp. 148–149, (1917), 1919.

[19] Stein, P. Nordamerikanische Anthomyiden. 2. Beitrag. *Arch. f. Naturgesch.*, LXXXIV, (A), hft. 9, pp. 63–74, 88–91, (1918), May 1920.

Malloch[20] in the same year published a key to thirty nine North American species of *Pegomyia*, of which twenty had been recently described by him from material collected in various parts of the United States and in Alaska. The key includes thirty two native species and seven european. The species *fuscofasciata* Malloch is in my opinion the true *winthemi* of Wiedemann, and Malloch's records of *winthemi* as well as those in many recent faunal lists refer to another species that I have recently renamed *mallochi*.

Cole and Lovett[21] in their catalogue of Oregon diptera refer only to three species of *Pegomyia* known to occur within the State. Huckett[22] recorded twenty species in the genus from New York, including the western forms *vanduzeei* and *acutipennis*. The former had been recently studied by Frost[23] as a leaf-miner of dock under the name *affinis* Stein. Johnson[24, 25] gave a list of eighteen species of *Pegomyia* in his faunal records for New England, and thirteen as occurring in the Mount Desert Region, including five species which had been originally described from that area by Malloch. Leonard[26] in 1928 recorded twenty two species in the genus in a list of insects for New York. The faunal pattern closely follows that given by Johnson for New England.

Séguy[27] in The Genera Insectorum, on the Muscidae of the World lists forty four nominal species under *Pegomyia* that occur in North America, and one is doubtfully included. The species

[20] Malloch, J. R. A synopsis of the North American species of the genus Pegomyia Robineau-Desvoidy (Diptera, Anthomyiidae). *Bull. Brooklyn Ent. Soc.*, XV, pp. 121–127, 1920.

[21] Cole, F. R. and A. L. Lovett. An annotated list of the Diptera (Flies) of Oregon. *Proc. Cal. Acad. Sci.*, XI, p. 313, 1921.

[22] Huckett, H. C. A systematic study of the Anthomyiinae of New York, with especial reference to the male and female genitalia. *N. Y. (Cornell) Agric. Exp. Station*, Mem. 77, pp. 40–48, (1923), 1924.

[23] Frost, S. W. Two species of Pegomyia mining the leaves of dock. *Journ. Agr. Research*, XVI, pp. 229–243, 1919.

[24] Johnson, C. W. Fauna of New England, XV. List of the diptera or two-winged flies. *Occ. Pap. Boston Soc. Nat. Hist.*, VII, pp. 232–233, 1925.

[25] Johnson, C. W. Biological Survey of the Mount Desert Region, part I, pp. 209–210, 1927.

[26] Leonard, M. D. A list of the insects of New York, with a list of the spiders and certain other allied groups. *N. Y. (Cornell) Agr. Exp. Station*, Mem. 101, pp. 840–841, (1926), 1928.

[27] Séguy, E. Genera Insectorum, Fasc. 205, pp. 48–67, 1937.

flavipes, *stlemba* and *virginea* I have yet to recognize as occurring in this region; the species *nitidula*, *setigera*, *trilineata*, I consider as belonging to *Hylemyia*. The latter genus as treated by Séguy contains the records of such North American species as *dissecta*, *glabra*, *juvenilis*, *latipalpis*, *nigroscutellata*, *pedestris* and *rubivora*, all of which I have included in my treatment of the genus *Pegomyia*. There are eleven North American species of *Pegomyia* included inadvertently in the genus *Pogonomyia* Rondani, namely *emmesia*, *fringilla*, *fuscofasciata*, *labradorensis*, *luteola*, *quadrispinosa*, *spinigerella*, *subgrisea*, *triseta*, *unguiculata*, and *unicolor*. Huckett[28] has recently published the names of thirty one new or little known pegomyian species from North America, one of which is recognized as occurring also in Sweden.

The present study records the occurrence of ninety seven species of *Pegomyia* sens.-lat. in North America, of which sixty nine are recognized as native species, twenty seven as having first been described from Europe and one from Siberia.

Key to Groups

1. Arista with hairs longer than setulae on second antennal segment 2
   Arista nearly bare or with hairs not longer than setulae on second antennal segment 3
2. Apical setulae of scutellum hairlike, cruciate bristles present, processes padded with setulae on proximal half of inner border, caudal pair of ocellar bristles in female short and directed forward ..... Virginea Group
   Apical setulae of scutellum coarser developed than hairs on ventral surface, cruciates absent or weakly developed, processes not padded with setulae, caudal pair of ocellar bristles in female longish and directed outwards ..... Connexa Group
3. Scutellum with three pairs of strong bristles, mesopleura with a few setulae on declivity dorsad of mesothoracic spiracle, posterior notopleural bristle with a few setulae at base ..... Major Group
   Scutellum with two pairs of strong bristles, mesopleura with no setulae on declivity dorsad of mesothoracic spiracle, posterior notopleural bristle with no setulae at base 4

[28] Huckett, H. C. Descriptions of new North American Anthomyiidae belonging to the genus Pegomyia Rob.-Desv. (Diptera). *Trans. Amer. Ent. Soc.*, LXV, pp. 1–37, 1939.

4. Costal thorn stoutly developed, costal setulae coarsely developed, at least in female, abdomen in male cylindrico-conical, hypopygium and copulatory appendages structurally similar to those of *lipsia*, *m–cu* cross vein invariably oblique and sinuate, if not, prealar bristle absent or long and robust.....5

Costal thorn and setulae inconspicuously and finely developed, abdomen in male usually depressed, hypopygium and copulatory appendages structurally not similar to those of *lipsia*, *m–cu* cross vein frequently nearly straight and erect, if oblique prealar bristle is present and shorter than length of anterior notopleural bristle.....6

5. Prealar bristle absent, second or lower posthumeral bristle absent, basal node of veins R_{2+3} and R_{4+5} usually with a few hairs on under surface Affinis Group

Prealar bristle present, long, second or lower posthumeral bristle usually present, basal node of veins R_{2+3} and R_{4+5} bare.....Lipsia Group

6. Apical setulae of scutellum hairlike, fifth sternum in male armed and shaped as in *dissecta* (fig. 61), apical anterodorsal bristle of hind tibia proportionately short, cruciate bristles present.....Dissecta Group

Apical setulae of scutellum coarser developed than hairs on ventral surface, or sometimes entirely absent, fifth sternum in male not armed nor shaped as in *dissecta*.....7

7. Male with numerous stout bristles on prebasal sclerite of hypopygium, female with caudal sclerites of ovipositor strongly chitinized and polished, appressed dorsoventrally.....Rubivora Group

Male with no bristles present on prebasal sclerite of hypopygium, female with caudal sclerites of ovipositor not noticeably appressed dorsoventrally, if apparently so, not extensively nor strongly chitinized.....8

8. Head with parafacials, parafrontals and cheeks extensively molded, as in *hyoscyami*, lower portion of occiput swollen, hind femur in male with bristles forming anterodorsal series not sharply differentiated into a proximal series of finer and shorter bristles and a distal series of stouter and longer bristles, ovipositor short, broadly conical, sclerites weak on dorsal surface and extensively setulose on ventral surface, segments concolorous with abdomen. .....Hyoscyami Group

Head with parafacials and parafrontals repressed and narrow, cheeks restricted and foreshortened caudad owing to the advanced position of the postgenal margin, e. g., *winthemi*, *geniculata*, lower portion of occiput not swollen, hind femur in male with bristles forming anterodorsal series much weaker and more closely set on proximal than on distal half, ovipositor with segments elongated and sclerites invariably slender and strongly chitinized, segments not concolorous with abdomen.....Flavipes Group

Virginea Group

There are two species belonging to this group recorded from North America, namely *palposa* Stein and *juvenilis* Stein. They would undoubtedly fall within the concept of Pegomyza of authors. The group is delimited by a combination of the following characters; Arista plumose, apical setulae of scutellum hairlike, cruciate bristles present, palpi flattish and broadened, processes of fifth abdominal sternum in male padded with setulae, basal sclerites of hypopygium polished, caudal pair of ocellar bristles in female short and directed cephalad.

Connexa Group

The species *connexa* Stein has usually been associated with *juvenilis* on account of plumosity of arista, thoracic markings and highly shining hypopygium in male. There are however a number of characters in which the two species differ, that serve to emphasize the artificiality of such a relationship. I am of the opinion that *connexa* and the european species *socculata* Zetterstedt belong to the same group. For diagnostic purposes both species may be described as having the arista subplumose, cruciate bristles absent, palpi slender, hypopygium and processes as in male of *connexa*, hypopygium highly shining, hind tibia in male with a short bristle on proximal half of posterior surface, female having discal bristles on fifth abdominal tergum and caudal pair of ocellar bristles longish and directed outward.

Major Group

The species belonging to this segregate are closely linked to the *lipsia*-group. They have been included in the North American genus *Eremomyia* by Stein. I am doubtful whether this genus can be maintained apart from *Hylemyia*, and have in this instance relegated the species with two antero- and two posterodorsal bristles on hind tibia to the genus *Pegomyia* sens.-lat. The group possesses the following combination of characters as found in *major;* Hind tibia with two antero- and two posterodorsal bristles

and a robust apical anterior bristle, scutellum with three pairs of strong bristles, wings with robust costal thorn and strongly oblique, sinuate *m–cu* cross vein, mesopleura with a few setulae on the declivity dorsad of mesothoracic spiracle and with the stigmatal bristles below spiracle largely devoid of accessory setulae, except in *thrixia*, posterior notopleural bristle with a few setulae at base, vibrissal angles armed with numerous (10–16) coarse black setulae, cruciate bristles absent, hypopygium and copulatory appendages of male as in *lipsia*, female with caudal pair of ocellar bristles long and directed outwards, marginal bristles of abdomen weakly developed. Species belonging to this group are *major* (Malloch), *incompleta* (Stein), *thrixia* Huckett, *assimilis* Huckett.

Lipsia Group

The group contains a large number of North American species belonging to the genus *Pegomyia*. One of the commonest forms is *P. lipsia* (Walker), which may be regarded as typical of the group. These species may be defined as having the abdomen of male cylindrico-conical, with hypopygium and copulatory appendages similar to those of *lipsia*. The abdomen in both sexes has the bristles stoutly developed on dorsum and vestiture comparatively short and uniform, the bristles of legs are strongly developed, hind tibiae are armed on antero- and posterodorsal surfaces respectively with usually only two long bristles exclusive of the apical bristles, wings possess a robust costal thorn and an oblique and markedly sinuate *m–cu* cross vein, cruciate bristles absent, caudal pair of ocellar bristles longish in female, erect and directed outward. The segregate is closely allied to the *major*-group, differing in that the species have no setulae on mesopleural declivity dorsad of mesothoracic spiracle nor at base of posterior notopleural bristle. The group includes the following species: *lipsia* (Walker), *lividiventris* Huckett, *chrysida* Huckett, *tarsata* (van der Wulp), *cresca* Huckett, *duplicata* (Malloch), *longimana* (Pokorny), *setiformis* Huckett, *fuscicauda* Huckett, *apicalis* (Stein), *costalis* (Stein), *flavicans* (Stein), *substriatella* (Malloch), *quadrispinosa* (Malloch), *frigida* (Zetterstedt), *banffi* Huckett, *anorufa* Stein, *labradorensis* Malloch, *partita* Huckett, *caduca* Huckett. It is possible that the last six

species and the european form *semirufa* Ringdahl may be entitled to separate group recognition. In general the male abdomen of the latter six species is more depressed and the *m–cu* cross vein is only slightly oblique and sinuate.

Affinis Group

The common North American species *Pegomyia affinis* Stein serves as a typical example of a small group that is known to have habits peculiarly different to those of flies belonging to other segregates within the genus. Adults of *affinis* may usually be found in the vicinity of rodent's burrows.[29] Malloch[30] has reported having captured *spinigerella* in dry sandy places frequented by burrowing bees. From rearings it is known that larvae of *gopheri* feed on the excrement found in the burrows of land turtles, *Gopherus polyphemus*.[31] Characters pertaining to the abdomen and legs of the adult fly have much in common with those of *lipsia*-group. In the male the abdomen is cylindrico-conical and hypopygial sclerites conform to the tapering outline of the caudal segments, processes are simple, unarmed, with a few bristles along outer border, inner border with a few scattered setulae, marginal bristles on terga are robust on dorsum and vestiture of setulae is short and appressed, costal thorn is typically robust and costal setulae coarsely developed in female, in many species the basal node of veins R_{2+3} and R_{4+5} has a few hairs on under surface, cross veins clouded and *m–cu* cross vein slightly oblique and sinuate, abdomen not infrequently variegated or partly yellowish in color, prealar and second posthumeral bristles absent, acrostical bristles setulose, closely biserial, and third antennal segment nearly as broad as long. Species included in this group are *affinis* Stein, *finitima* Stein, *gopheri* Johnson, *spinosissima* Stein, *spinigerella* Malloch.

[29] Curran, C. H. Note on Pegomyia affinis Stein (Diptera, Muscidae). *Can. Ent.*, LVIII, p. 256, 1926.

[30] Malloch, J. R. Descriptions of new North American Anthomyiidae (Diptera). *Trans. Amer. Ent. Soc.*, XLVI, p. 179, 1920.

[31] Johnson, C. W. Insects of Florida. I. Diptera. *Bull. Amer. Mus. Nat. Hist.*, XXXII, pp. 77–78, 1913.

Dissecta Group

The group is represented by nine species, of which *dissecta* (Meigen) is typical. It may be described as possessing the following combination of characters, which although variable may be regarded as sufficiently characteristic of the group to be of some value for diagnostic purposes: Apical setulae of scutellum hairlike, conforming in structure to the ventral hairs, palpi flattish, cruciate bristles present in both sexes, apical anterodorsal bristle of hind tibia proportionately short, *m–cu* cross vein erect, lower surface of costa adjacent costal cell (*2C.*) nearly devoid of setulae, wings in male pointed apicad, processes of fifth abdominal sternum armed and shaped as in *dissecta*, eyes in male closely approximated at narrowest part of frons, with a pair of parafrontal setulae present near anterior ocellus. The following species are known to occur in North America, a) tibiae black, *dissecta* (Meigen), *pseudodissecta* (Ringdahl), *nigroscutellata* (Stein), *latipalpis* (Stein), *cuticornis* Huckett, b) tibiae yellow, *acutipennis* Malloch, *abnormis* Stein, *anabnormis* Huckett, *rectifrons* Huckett.

Rubivora Group

The species associated with *rubivora* and *dissecta* have been placed in *Phorbia* and *Chortophila* respectively by many authors owing evidently to their black legs and subnude arista. It is apparent from an examination of North American material that there are species related to *rubivora* and *dissecta* that have yellowish tibiae, and which may be included in the respective groups on the basis of characters pertaining to the hypopygium, copulatory appendages and ovipositor. In the males of the *rubivora*-group the processes are subshining and lined along inner margin by a series of setulae, the prebasal sclerite is well bristled, in the female the caudal sclerites of ovipositor are shiney and strongly chitinized, being appressed dorsoventrally. The darker colored forms of the group may be further distinguished from species belonging to the *dissecta*-group by the proportionately greater size of third antennal segment, coarser development of apical setulae on scutellum, denser hairs on under surface of costa, absence of cruciate bristles

in male and their absence or weak development in female. Further in the female the caudal pair of ocellar bristles is not long and is directed cephalad, and the fifth tergum has comparatively stronger discal and marginal bristles than in females of *dissecta*-group. The paler forms of the *rubivora*-group exhibit certain affinities to *triseta* and related forms in *hyoscyami*-group, from which they differ basically on account of abdominal characters as defined above. The species are as follows: a) tibiae black, *rubivora* (Coquillett), b) tibiae yellowish, *glabra* (Stein), *cedrica* Huckett. To these may also be added the european forms *Chortophila dentiens* Pandellé and *C. rubricola* Enderlein.

Hyoscyami Group

This is a large rather heterogeneous group consisting mostly of species known to mine the leaves of vegetation, e. g., *hyoscyami, vanduzeei, bicolor, nigritarsis, albimargo.* These five typical species are characterized by having the parafrontals and parafacials full and prominent in profile, cheeks invariably broadly maintained caudad, ventral half of occiput swollen, arista subnude, cruciate bristles absent, abdomen in male slightly depressed, basal sclerite of hypopygium proportionately robust, giving the abdomen a truncated appearance, anal sclerite (ninth tergum) broadly rounded when viewed from above, gonostyli (inferior forceps) short, broad, deeply fissured and incised, processes weakly bristled, ovipositor short, broadly conical, dorsal sclerites weakly chitinized and ventral sclerites minutely setulose, segments concolorous with abdomen, anterodorsal bristles of hind femur in male not sharply differentiated into a proximal series of finer and shorter bristles and a distal series of stouter and longer bristles, nor is the series of posterior setulae on hind femur so extensively developed apicad as in the *flavipes*-group, wings with costal thorn and setulae weakly developed, *m–cu* cross vein semierect and nearly straight, caudal pair of ocellar bristles short and directed cephalad in female.

Hyoscyami Subgroup.—Processes frequently shiny and bare apicad, antennae proportionately short, face and oral margin constricted, ventral region of occiput swollen, prealar bristle weak or absent, ventral bristle of caudal pair of sternopleural bristles fre-

quently short in female, mesonotum not quadrivittate in male. Species include *hyoscyami* (Panzer), *carduorum* Huckett, *striata* Stein, *indicta* Huckett, *atlanis* Huckett, *convergens* Huckett, *ruficeps* Stein, *rufescens* Stein, *minuta* Malloch, *cognata* Stein, *vicaria* Huckett, *marginata* Huckett.

Vanduzeei Subgroup.—Processes with a tuftlike series of setulae at base and at apex on inner margin, widely spaced apart at base, arista swollen at base, prealar bristle longer than in *hyoscyami-* or *albimargo*-subgroups, ventral half of occiput swollen, ventral bristle of caudal pair of sternopleural bristles moderately long in female. Species include, *vanduzeei* Malloch, *haemorrhoa* (Fallén), and the european form *versicolor* (Fallén).

Albimargo Subgroup.—Processes bare distad, with fine setulae restricted to basal area, apex of inner margin produced, anterodorsal series of bristles and posterior series of setulae on hind femur of male more markedly differentiated and extended respectively than in allied subgroups, presutural acrostical bristles well developed, mesonotum in male with four linear markings when viewed from behind, situated in the planes between acrostical and dorsocentral, and dorsocentral and intraalar series of bristles respectively, arista not swollen at base, abdomen more distinctly depressed in male. Species include *flavifrons* (Walker), *sitiens* Huckett, *albimargo* (Pandellé) and the european form *esuriens* (Meigen).

Bicolor Subgroup.—Processes restricted, bare and rounded distad, with setulae confined to basal region and in a sparse series along inner margin, hind femur stoutly bristled, presutural acrostical bristles weakly developed, in two adjacent series, in female the ventral sternopleural bristle of caudal pair is well developed and frontal vitta proportionately narrower than in female of allied subgroups. Species include *bicolor* (Wiedemann), *jacobi* Malloch, *triseta* Malloch, *setaria* (Meigen), *variegata* Huckett.

Nigritarsis Subgroup.—Closely allied to *bicolor*-subgroup, differing in that the processes are broad laminate plates with a dense series of setae along inner margin. Species include *nigritarsis* (Zetterstedt) and *rumicifoliae nom. nov.* (p. 81).

Flavipes Group

This group consists of three smaller segregates which may be distinguished from one another by the structure and bristling of the processes in male sex, as represented in *gilva* (Zetterstedt), *geniculata* (Bouché) and *intersecta* (Meigen) respectively. The group characters are most evident in the male, where they may be described as follows: Abdomen depressed, with lateral margins subparallel and terga clothed with longish erect setulae, abdominal vitta if present composed of lineal sections, hind femur with bristles forming anterodorsal series much weaker and more closely set on proximal than on distal half, posterior surface with median series of fine setulae extending distad to preapical bristle, head with parafrontals, parafacials and cheeks reduced to slender and narrow proportions, eyes nearly contiguous at narrowest part of frons, oral margin between vibrissae not constricted, ventral region of occiput not buccate nor swollen, antennae moderate to large, wings pointed apicad, costa slender and with setulae and thorns weakly developed, *m–cu* cross vein slightly to moderately oblique, ovipositor with sclerites invariably strongly chitinized and segments elongated.

Flavipes Subgroup.—Hypopygium considerably enlarged by the angular broadening of the ninth tergum caudad (ventrad), particularly in the region of gonostyli and cerci, fifth sternum composed of a large basal plate from which the processes extend as slender pliant lamellae, the latter bear a series of prominent bristles which often appear flaccid, the series extends from base to near apex, otherwise the fifth sternum is largely devoid of bristles, processes are markedly constricted at junction with basal plate through the intrusion of the outer conjunctival membrane, in many of the species the caudal sclerites of ovipositor are rigid and compressed as if for piercing, and marginal bristles of fifth tergum in female are robustly developed laterad. Species are *gilva* (Zetterstedt), *pilosa* Stein, *tenera* (Zetterstedt), *incisiva* Stein, *rufipes* (Fallén), *vittigera* (Zetterstedt).

Geniculata Subgroup.—Hypopygium and processes inconspicuous, the latter clothed with numerous short bristles throughout,

acrosticals in two widely separated series, antennae large. Species are *geniculata* (Bouché), *univittata* (von Roser), *unicolor* Stein, *winthemi* (Meigen), *mallochi* Huckett, *rufina* (Fallén), *flavipalpis* (Zetterstedt), *corrupta* Huckett, *pollinosa* Ringdahl, *longicornis* Huckett.

Intersecta Subgroup.—Abdomen in male tapering caudad, hypopygium subshining, ninth tergum angular and protruded, armed dorsad (cephalad) with a few weak bristles, basal sclerite polished, processes horney, bare and laminate, cruciate bristles present in both sexes. Species are *intersecta* (Meigen), *unguiculata* Malloch, *tacta* Huckett, *solitaria* Stein.

The following species have not been associated with any group, *alticola* Huckett, *analis* Schnabl, *caesia* Stein, *littoralis* Malloch, *lunatifrons* (Zetterstedt), *marginata* Huckett, *palpata* Stein, *tinctisquama* Huckett.

Key to Species of Pegomyia

Males

1. Legs entirely black, at most knees yellowish tinged 2
   Legs at least partly yellowish, occasionally tibiae fuscous 18
2. Mid tibia with a mid ventral or anteroventral bristle 3
   Mid tibia with no mid ventral or anteroventral bristle 5
3. Antennae separated by a prominent rounded facial elevation, basal hairs on outer margin of calyptrae blackish tinged, apical setulae of scutellum hairlike as those on ventral surface, propleura with a few hairs near center .... *Paregle aestiva* (Meigen)
   Antennae not separated by a prominent rounded facial elevation, basal hairs on outer margin of calyptrae not blackish tinged, apical setulae of scutellum coarser developed than hairs on ventral surface, propleura bare 4
4. Prealar bristle short, second antennal segment with a small wartlike tubercle on dorsal surface, oral margin protruded cephalad, hind femur with no bristles on posteroventral surface ..... *Paregle cinerella* (Fallén)
   Prealar bristle long, second antennal segment with no wartlike tubercle on dorsal surface, oral margin not protruded cephalad, hind femur with bristles on posteroventral surface ..... *analis* Schnabl
5. Arista plumose, processes with mattlike pad of setulae on inner border, lower calyptral scale extensively protruded beyond margin of upper, prealar bristle not shorter than length of anterior notopleural bristle. *palposa* (Stein)

Arista short pubescent or bare, processes with no mattlike pad of setulae along inner border, lower calyptral scale not extensively protruded beyond margin of upper scale, prealar bristle shorter than anterior notopleural bristle 6

6. Hypopygium shining black, processes devoid of bristles and are extended as thin chitinous plates (as in *unguiculata*) which are prolonged at apex into an accessory digitlike appendage (fig. 55) ..... *intersecta* (Meigen)

Hypopygium not polished black, processes with a few setulae and not terminating in an accessory appendage 7

7. Head with inner pair of vertical bristles erect and bristlelike, frontal vitta ribbandlike throughout its length to ocellar callosity, velvety black, cruciate setae longish, hind tibia with apical posterodorsal bristle well developed, as long as apical dorsal bristle ..... *littoralis* Malloch

Head with inner pair of vertical bristles setulose, cruciates weak or absent, frontal vitta largely constricted or obliterated caudad by parafrontals, hind tibia seldom with apical posterodorsal bristle as long as apical dorsal bristle 8

8. Apical setulae of scutellum hairlike as those on ventral surface, hind tibia with apical anterodorsal bristle short, not longer than height of hind metatarsus, processes like those of *dissecta* (fig. 61) 9

Apical setulae of scutellum coarser developed than ventral hairs, hind tibia with apical anterodorsal bristle invariably slightly longer than height of hind metatarsus, processes not like those of *dissecta* 13

9. Cheek as high as width of third antennal segment, margin of eye scarcely reaching a level below the vibrissae, ventral border of cheek with a coarse series of setulae and slender bristles 10

Cheek narrower than width of third antennal segment, margin of eye extending ventrad of level with oral vibrissae, cheeks with a single series of bristles along ventral border 11

10. Cross vein *m–cu* oblique, ultimate section of $M_{.1+2}$ shorter than 1.5 times length of penultimate section, anterior sternopleural bristle as robust in development as ventral bristle of caudal pair, hind femur with bristles on distal half of anteroventral surface longer than those on proximal half ..... *cuticornis* Huckett

Cross vein *m–cu* erect, ultimate section of $M_{.1+2}$ fully as long as 1.5 times length of penultimate section, anterior sternopleural bristle slightly finer developed than ventral bristle of caudal pair, hind femur with a series of uniformly long bristles throughout anteroventral and proximal half of posteroventral surfaces ..... *pseudodissecta* (Ringdahl)

11. Anterior sternopleural bristle finer developed than ventral bristle of caudal pair, occipital setulae on ventrocentral plane adjacent oral margin stiff and

spinulose, postsutural area of mesonotum when viewed from behind with three broad vittae which are continued to base of scutellum..... .....*dissecta* (Meigen)

Anterior sternopleural bristle as robust as ventral bristle of caudal pair, occipital setulae on ventrocentral plane slender, postsutural area of mesonotum with lateral vittae at least obscure or obliterated before reaching base of scutellum.....12

12. Stigmatal bristles below mesothoracic spiracle with five or six setulae at base, mesonotum brownish black, under surface of costa bordering costal cell (2 *C.*) bare.....*latipalpis* (Stein)

Stigmatal bristles seldom with more than one or two setulae at base, mesonotum grayish black, under surface of costa bordering costal cell has a few setulae.....*nigroscutellata* (Stein)

13. Prebasal sclerite of hypopygium prominent and bristled, eyes separated by a distance not less than that between posterior ocelli inclusive.....14

Prebasal sclerite concealed and bare, eyes seldom separated by a distance as great as that between posterior ocelli.....15

14. Parafacials narrower than breadth of third antennal segment, processes truncated at apex, inner margin fringed with a continuous series of setulae .....*rubivora* (Coquillett)

Parafacials fully as broad as width of third antennal segment, processes tapering apicad, inner margin with a partial series of setulae, becoming discontinued basad.....*glabra* (Stein)

15. Mesonotum, viewed from behind, with four short postsutural stripes, situated respectively between the series of acrostical and dorsocentral, dorsocentral and intraalar bristles.....*flavifrons* (Walker)

Mesonotal stripes, if present, situated between the series of acrostical bristles or in the planes of the macrochaetae.....16

16. Processes widely separated at base by the basal plate, tufted with setulae at base and at apex as in *vanduzeei* (fig. 63), cerci broadly yellowish..... .....*haemorrhoa* (Zetterstedt)

Processes nearly contiguous basad, apical region not tufted with setulae, cerci not broadly yellowish.....17

17. Middle pair of presutural acrostical bristles closer to one another than to their respective series of dorsocentral bristles, with no setulae between the series, calyptrae with brownish hairs and margin, processes sparsely setulose.....*fumipennis* Huckett

Series of presutural acrostical bristles not closer to one another than to their respective series of dorsocentral bristles, with setulae between the series, calyptrae with pale hairs and margin, processes with a dense series of marginal setulae proximad.....*longicornis* Huckett

18. All femora largely and uniformly infuscated, sometimes mid and hind pairs slightly paler than fore pair 19
    All femora largely yellowish, or first pair more or less infuscated, second and third pairs largely yellowish or at most tinged superficially 48
19. Prealar bristle as long as or longer than anterior notopleural bristle 20
    Prealar bristle shorter than anterior notopleural bristle, or absent 26
20. Posterior notopleural bristle with a few setulae at base, mesopleura with a few hairs on declivity dorsad of mesothoracic spiracle, hind tibia with apical anterior bristle strongly developed, vibrissal area with numerous (10–16) coarse black setulae 21
    Posterior notopleural bristle with no setulae at base, mesopleura devoid of hairs on declivity dorsad of mesothoracic spiracle, hind tibia with apical anterior bristle weakly developed or absent, vibrissal area with a few slender setulae 24
21. Second antennal segment extensively reddish yellow ..... *major* (Malloch)
    Second antennal segment extensively blackish 22
22. Mid femur with no bristle on distal half of anteroventral surface, mid and hind femora broadly reddish suffused throughout distal third, eyes separated by a distance not greater than maximum width of frontal vitta cephalad ..... *assimilis* Huckett
    Mid femur with a bristle on distal half of anteroventral surface, mid and hind femora narrowly reddish distad, eyes separated by a distance slightly greater than maximum width of frontal vitta cephalad 23
23. Parafrontals with a few setulae opposite ocellar callosity, mid and hind femora with short posteroventral bristles, which are not longer than maximum breadth of femur, abdominal sterna 3 and 4 with sparsely arranged bristles, hypopygium not notably large, abdomen tapering caudad ..... *thrixia* Huckett
    Parafrontals with no setulae opposite ocellar callosity, mid and hind femora with many posteroventral bristles longer than maximum breadth of femur, abdominal sterna 3 and 4 with bristles densely arranged on caudal half, cephalic half being bare, hypopygium large, abdomen well maintained caudad ..... *incompleta* (Stein)
24. Mid femur with a bristle on distal half of anteroventral surface, fore tibia with apical posterodorsal bristle robust, eyes separated by a distance equal to width of third antennal segment ..... *apicalis* (Stein)
    Mid femur with no bristle on distal half of anteroventral surface, fore tibia with apical posterodorsal bristle setulose or weakly developed, eyes separated by a distance less than breadth of third antennal segment 25
25. Abdomen conical, hypopygium black and shining, processes like those of *lipsia* (fig. 78), *m–cu* cross vein oblique and sinuate, presutural acrostical

bristles in two well separated series, with setulae between the series.... .....*fuscicauda* Huckett

Abdomen depressed, hypopygium pruinescent and concolorous with terga, processes like those of *vanduzeei* (fig. 63), *m–cu* cross vein erect, presutural acrostical bristles in two closely adjacent series, with no setulae between series.....*haemorrhoa* (Zetterstedt)

26. Costal thorn robust and prominent, cross veins usually clouded, basal node of veins R_{2+3} and R_{4+5} usually with a few hairs on under surface.....27

Costal thorn short and inconspicuous, cross veins usually clear, base of veins R_{2+3} and R_{4+5} bare on under surface.....28

27. Third antennal segment yellowish proximad, apical posterodorsal bristle of fore and hind tibiae robust, mid femur with a strong bristle on distal half of anteroventral surface, costal setulae strongly developed, as long as postocular setulae.....*spinigerella* Malloch

Third antennal segment blackish, apical posterodorsal bristle of fore and hind tibiae invariably setulose or weakly developed, mid femur with no bristle on distal half of anteroventral surface, costal setulae in no prominently strong series.....*affinis* Stein

28. Parafacials in profile narrow, at base of antennae not broader than one fifth diameter of eye measured at a point immediately caudad, frontal vitta restricted, shortest distance between vibrissa and eye margin much shorter than length of third antennal segment, eye margin extending caudoventrad to almost coincide with postgenal margin, thereby restricting the genal sclerite caudad, occipital region not swollen, e. g., *geniculata* (fig. 94)...29

Parafacials in profile and from above prominent and extensive, at base of antennae as wide as one fourth diameter of eye measured at a point immediately caudad, frontal vitta extensive, shortest distance between vibrissa and eye margin nearly equal to length of third antennal segment, cheeks well maintained caudad, extending distinctly caudad of the lower margin of eye, e. g., *hyoscyami* (fig. 93).....36

29. Apical setulae of scutellum hairlike, abdominal terga 3 to 5 with trace of fuscous markings along cephalic border in addition to dorsocentral stripe, sternum 5 with processes like those of *dissecta*.....30

Apical setulae of scutellum coarser developed than hairs on ventral surface, or absent, abdominal terga 3 to 5 with no trace of fuscous markings along cephalic border, processes not as in *dissecta*, with a fringe of fine slender setulae along inner margin.....31

30. Palpi entirely blackish.....*acutipennis* Malloch

Palpi largely yellow.....*anabnormis* Huckett

31. Hind femur with a series of ten or more black spinulose setulae on posteroventral surface, copulatory appendages and hypopygium like those of *gilva* (fig. 66).....*rufipes* (Zetterstedt)

Hind femur not armed with a series of spinulose setulae on posteroventral surface, copulatory appendages and hypopygium not like those of *gilva*..32

32. Abdomen slender, terga clothed throughout with slender erect bristles, marginal series inconspicuous, costa bounding cells *Sc.* and $R_{.1}$ becoming notably much broader than the attenuated section bounding cell 2 *C*..... .....*lunatifrons* (Zetterstedt)

Abdomen of normal robust proportions, terga with a conspicuous marginal series of stout bristles, costal vein of normal and uniform breadth along cells *Sc.*, $R_{.1}$, and 2 *C*.....33

33. Abdomen subfuscous, reddish with blackish incisures along caudal margin of terga, scutellum obscurely reddish testaceous apicad, wings brownish tinged throughout.....*corrupta* Huckett

Abdomen and mesonotum concolorous, entirely grayish black, scutellum entirely blackish, wings at most faintly smoky.....34

34. Third antennal segment about three times as long as second segment, apex reaching a level with oral margin, series of presutural acrostical bristles separated by a distance fully equal to that between the respective series of acrostical and dorsocentral bristles, processes sharply tapering apicad.... .....*longicornis* Huckett

Third antennal segment shorter than three times length of second segment, apex not reaching a level with oral margin, series of presutural acrostical bristles closer together than distance separating the respective series of acrostical and dorsocentral bristles, processes not sharply tapering on distal half.....35

35. Mesonotum viewed from behind with four postsutural stripes, situated respectively between the series of acrostical and dorsocentral bristles, and between the dorsocentral and intraalar bristles, processes short, widely spaced apart at base, apical region extended slightly at inner margin.... .....*flavifrons* (Walker)

Mesonotum with no such postsutural stripes, processes longish, twice as long as average width, approximated basad, apical region not produced at inner margin.....*aninotata* Huckett

36. Prealar bristle absent, *r–m* cross vein slightly infuscated, abdominal terga 4 and 5 with transverse series of discal bristles, proboscis slender *cognata* Stein

Prealar bristle present except in *minuta*, *r–m* cross vein clear, abdominal terga 4 and 5 with no transverse series of discal bristles.....37

37. Third antennal segment yellowish at base.....38

Third antennal segment entirely blackish.....39

38. Third antennal segment with transverse pale area at base on inner side, presenting the appearance of an overlapping scale, processes with a dense series of setulae along inner border at base.....*ruficeps* Stein

Third antennal segment with no marked indications of pale scalelike pattern at base on inner side, processes with no dense series of setulae along inner border.....*rufescens* Stein

39. Palpi yellowish or reddish 40
Palpi fuscous, at least at apex 41
40. Tarsi yellow, second antennal segment entirely yellow, mesonotum with no markings, processes with no tuft of setulae at apex or at base, prealar bristle absent ..... *minuta* Malloch
Tarsi blackish, second antennal segment tinged with fuscous, mesonotum with pronounced vittae along planes of dorsocentral bristles, processes with tuftlike series of setulae at apex and at base, prealar bristle present ..... *vanduzeei* Malloch
41. Second antennal segment entirely yellowish, vibrissae separated by a distance less than height of cheek, processes grayish drab with a thickened polished strip along distal half of inner margin ..... *convergens* Huckett
Second antennal segment infuscated or brownish, vibrissae separated by a distance greater than height of cheek 42
42. Fore, mid and hind femora largely yellowish, with trace of fuscous permeating the integument, coxae reddish, processes devoid of bristles, with only a few sparse setulae, cerci and styli black and polished ..... *striata* Stein
Fore, mid and hind femora decidedly and for the greater part infuscated or blackish, processes with numerous bristles and setae, coxae blackish 43
43. Mesonotum viewed from behind with four postsutural vittae, situated respectively between planes of acrostical and dorsocentral, dorsocentral and intraalar series of bristles, scutellum with a dark fascia along base ..... *flavifrons* (Walker)
Mesonotum with no such interserial stripes, if present they lie dorsocentral or along the planes of dorsocentral and intraalar series of bristles, scutellum with no dark fascia across base 44
44. Hind tibia with apical posterodorsal bristle strongly developed, mid tibia with a weak mid anterior bristle near anterodorsal bristle, parafrontals bristled for entire length, abdomen conical, processes as in *bicolor* (fig. 90) ..... *jacobi* Malloch
Hind tibia with apical posterodorsal bristle slender and weakly developed, mid tibia with no weak anterior bristle, parafrontals not bristled for entire length, abdomen depressed, processes not like those of *bicolor* 45
45. Processes broadly produced throughout, widely truncated at apex, distal half and inner border yellowish, polished and bare, mid and hind femora broadly yellowish on apical region, extending to include preapical bristles, hind tibia with four or more anterodorsal bristles ..... *indicta* Huckett
Processes not truncated at apex but tapering distad, mid and hind femora narrowly yellowish at apex, hind tibia with not more than three anterodorsal bristles 46
46. Parafacials at base of antennae fully as wide as height of cheek, eyes separated by a distance fully as great as that between posterior ocelli inclusive, prebasal sclerite with numerous bristles ..... *glabra* (Stein)

Parafacials not wider than height of cheek, eyes separated by a distance less than that between posterior ocelli inclusive, prebasal sclerite bare.....47

47. Processes with a tuftlike series of setulae at apex as in *vanduzeei* (fig. 63), proboscis polished and slender, postocular setulae fine and long, mesonotum inconspicuously striped.....*haemorrhoa* (Zetterstedt)

Processes devoid of setulae at apex, proboscis pollinose and short, postocular setulae short and coarse, mesonotum with a conspicuous brownish dorsocentral vitta.....*atlanis* Huckett

48. Prealar bristle long and robust, longer than or as long as anterior notopleural bristle, if of about equal length abdomen black.....49

Prealar bristle absent or shorter than length of anterior notopleural bristle, if of about equal length abdomen reddish yellow.....71

49. Arista with hairs longer than setulae on second antennal segment, sparsely distributed.....50

Arista with hairs scarcely longer than setulae on second antennal segment, pubescent.....51

50. Processes with a matt of short stiff setulae on proximal half of inner border, arista plumose, longest hairs as long as width of third antennal segment, palpi spatulate, fore femora at base with a conspicuous well defined brownish area on anterior (inner) surface, hind tibia with no posterior bristle on proximal half.....*juvenilis* (Stein)

Processes with no mattlike series of stiff setulae on proximal half of inner border, arista subplumose, longest hairs not as long as width of third antennal segment, palpi slender, fore femora at base of anterior (inner) surface with no such well defined marking, hind tibia with a posterior bristle on proximal half.....*connexa* Stein

51. Abdomen largely reddish yellow, or if more or less infuscated or blackened, is not concolorous with thorax and the humeral callosities are also reddish 52

Abdomen and mesonotum, including humeral callosities, grayish black, concolorous.....56

52. Thorax largely reddish to yellowish, hind tibia with a short bristle on proximal half of posterior surface, mid femur with a bristle on distal half of anteroventral surface.....53

Thorax largely blackish, hind tibia with no posterior bristle on proximal half, mid femur with no anteroventral bristle on distal half.....54

53. Third antennal segment and palpi entirely blackish.....*partita* Huckett

Third antennal segment and palpi in part or wholly yellowish.....*labradorensis* Malloch

54. Processes developed as broad platelike appendages, with a series of longish black setae along inner margin from base to apex, second and third sterna quadrate in outline, scutellum yellowish at apex.....55

Processes not developed as broad platelike appendages, with longish setae confined to apical region of inner margin, second and third abdominal

sterna elongate, narrow, scutellum entirely grayish black.....
.....*lividiventris* Huckett

55. Palpi yellow, third antennal segment yellowish at base.*rumicifoliae* nom. nov.
Palpi fuscous, third antennal segment entirely blackish.....
.....*nigritarsis* (Zetterstedt)

56. First and seond antennal segments entirely yellowish or reddish, lunule yellowish.....57
Second antennal segment largely fuscous or blackish, reddish or yellowish portion restricted to distal border.....63

57. Both fore and hind tibiae with apical posterodorsal bristle well developed, abdominal sterna 2 and 3 clothed with numerous longish bristles throughout
.....58
Either fore or hind tibia, or both, with apical posterodorsal bristle setulose or finely developed.....59

58. Costa with a series of prominently long setulae proximad and distad of costal thorn, all longer than diameter of costa, the longest as long as *r–m* cross vein, halteres yellowish.....*costalis* (Stein)
Costa with no series of longish setulae adjacent costal thorn, at most with one longer setula, halteres purplish.....*substriatella* (Malloch)

59. Mid femur with a robust bristle on distal half of anteroventral surface, palpi entirely yellow, mid femur with a series of short bristles throughout distal half of posteroventral surface, hind femur with two strong posteroventral bristles.....*flavicans* (Stein)
Mid femur with no robust bristle on distal half of anteroventral surface, palpi fuscous on distal half or at tip, mid femur with no series of short bristles throughout distal half of posteroventral surface, hind femur with one strong posteroventral bristle.....60

60. Fore tibia with apical posterodorsal bristle well developed.....61
Fore tibia with apical posterodorsal bristle setulose.....62

61. Processes entirely yellowish, abdomen with a fine linear dorsocentral marking, terga densely pollinose, wings yellowish tinged.....*tarsata* (van der Wulp)
Processes largely blackish, abdomen with a narrow dorsocentral vitta, wings at most faintly smoky.....*cresca* Huckett

62. Mesonotum viewed from behind with a prominent dark streak on each side, second and third abdominal sterna subquadrate and densely clothed with uniformly fine erect setulae, wings and calyptrae yellowish, cross veins clear.....*lipsia* (Walker)
Mesonotum with no prominent blackish streaks along declivities, second and third abdominal sterna elongate and tapered caudad, clothed with sparse appressed setulae, wings and calyptrae hyaline, not intensively yellowish tinged, cross veins clouded.....*chrysida* Huckett

63. Mid femur with an anteroventral bristle on distal half, which is usually stoutly developed.....64
Mid femur with no anteroventral bristle on distal half.....68

64. Hind tibia with a short bristle on proximal half of posterior surface, fore tibia with apical posterodorsal bristle absent or setulose....*banffi* Huckett
Hind tibia with no short bristle on proximal half of posterior surface, fore tibia with a robust apical posterodorsal bristle.....65
65. Eyes separated by a distance as great as width of third antennal segment, frontal vitta uninterrupted as far as ocellar callosity, mid tibia with a short anteroventral bristle at middle, penultimate section of vein $M_{.1+2}$ as long as distal section, *m–cu* cross vein sloping in a plane that if extended anteriorly would intersect costa at the point of union with vein $R_{.2+3}$.....66
Eyes separated by a distance less than breadth of third antennal segment, parafrontals contiguous, interrupting frontal vitta, mid tibia with no anteroventral bristle, penultimate section of vein $M_{.1+2}$ slightly shorter than distal section, *m–cu* cross vein sloping in a plane which if extended anteriorly would intersect costa at a point distinctly proximad of that at union with vein $R_{.2+3}$.....67
66. Hypopygium and processes largely yellowish, fore femur with infuscation along dorsal half only, costal setulae proximad of costal thorn in a prominent erect series, the setulae longer than diameter of costa.....*anorufa* Stein
Hypopygium and processes largely blackish, fore femur with infuscation throughout proximal half, costal setulae short and in an inconspicuous series.....*quadrispinosa* (Malloch)
67. Hypopygium shining and black, abdomen and thorax shiny, the latter with conspicuous blackish streaks along declivities of mesonotum, calyptrae intensively yellowish, wings yellowish tinged.....*frigida* (Zetterstedt)
Hypopygium grayish pruinescent, subshining, abdomen and thorax largely opaque, not shiny or lustrous, mesonotum with no conspicuous streaks along declivities, calyptrae and wings clear.....*caduca* Huckett
68. Hypopygium blackish, subshining, not concolorous with the grayish abdominal terga, basal sclerite of hypopygium with a number of short erect bristles, scattered, and in no perceptible single series around the mesal puckered area on caudal border.....69
Hypopygium grayish pollinose, opaque, concolorous with abdominal terga, basal sclerite with bristles arranged in a semicircular series bordering the mesal puckered area.....70
69. Fore and hind tibiae with a robust apical posterodorsal bristle, eyes separated by distance equal to that between posterior ocelli, mid tibia with mid anteroventral bristle.....*setiformis* Huckett
Hind tibia at least with apical posterodorsal bristle weakly developed, fore tibia invariably with apical posterodorsal bristle setulose, eyes separated by a distance less than that between posterior ocelli, mid tibia with no mid anteroventral bristle.....*fuscicauda* Huckett
70. Cross veins clouded, fore tibia with usually a well developed apical posterodorsal bristle, mid femur frequently with a well developed bristle on proximal half of anteroventral surface.....*duplicata* (Malloch)

Cross veins not clouded, fore tibia with apical posterodorsal bristle setulose or weakly developed, mid femur seldom with a bristle on proximal half of anteroventral surface ..... *longimana* (Pokorny)

71. Hind tibia with a long strong bristle at middle of dorsal surface, and with no posterodorsal bristles nor apical dorsal bristle ..... *solitaria* Stein

Hind tibia with no bristle at middle of dorsal surface, but with two or more posterodorsal bristles and with an apical dorsal bristle 72

72. Eyes widely separated, distance equal to length of third antennal segment, parafrontals at narrowest as wide as half breadth of third antennal segment, processes similar to those of *dissecta*, hind coxae with a few hairs proximad on caudal surface ..... *abnormis* Stein

Eyes separated by a distance not equal to length of third antennal segment, parafrontals at narrowest less than half breadth of third antennal segment 73

73. Hypopygium and processes polished and black, abdomen black, processes of horny appearance, devoid of bristles, like those of *intersecta* (fig. 55) .... *unguiculata* Malloch

Hypopygium not polished, at most subshining and with at least trace of pruinescence, processes conforming in appearance to the basal plate of fifth sternum, clothed with bristles and setulae, or, if hypopygium is shining and processes horny and bare then abdomen is reddish and processes armed with a series of coarse setulae across apical border, *c. f.*, *tacta*.. 74

74. Hind femur with a series of five to eight strong bristles on distal half of anteroventral surface, which are abruptly much longer than the short bristles on proximal half, and most of which are longer or fully as long as those bristles comprising the anterodorsal series, bristles comprising the proximal series on anteroventral surface shorter than those comprising the proximal series on anterodorsal surface, hind tibia with noticeably long setulae on anterior and anteroventral surfaces, fore femur with a series of three or four long bristles on proximal half of posterior surface, longer than those of posteroventral series ..... *pilosa* Stein

Hind femur with bristles on anteroventral surface gradually becoming longer distad, not sharply divided into longer and shorter bristles on distal and proximal halves respectively, hind tibia with no longish setulae on anterior or anteroventral surfaces, fore femur with at most one or two conspicuously long strong bristles on proximal half of posterior surface 75

75. Lower calyptra widely protruded beyond margin of upper scale 76

Lower calyptra subequal with upper scale, or more restricted in its extension beyond margin of upper scale 79

76. Antennae entirely yellowish, thorax largely yellowish, setulae clothing occipital region of head, humeral callosities, mesopleura, sternopleura and anterior surface of fore coxae golden in color ..... *unicolor* Stein

Antennae and thorax largely blackish, setulae clothing most of the above parts blackish in color 77

77. Scutellum entirely blackish, second antennal segment largely blackish..... ..... *rufina* (Fallén)

Scutellum yellowish apicad, second antennal segment yellowish 78

78. Palpi fuscous, mesonotum with no trace of a second posthumeral bristle, surface in this region almost devoid of setulae, scutellum nearly devoid of setulae on discal area ..... *mallochi* Huckett

Palpi yellow, mesonotum with a well developed second posthumeral bristle, scutellum with numerous setulae on discal area..... *winthemi* (Meigen)

79. Palpi entirely yellow or reddish throughout distal half 80

Palpi fuscous and blackish 103

Palpi yellow or reddish, apex or distal portion darkened or infuscated.... 115

80. Ninth tergum (anal sclerite) prominently broadened along ventral border when viewed laterad, cerci comparatively small, fifth sternum with a proportionately large basal plate and slender weak processes which bear a series of coarse black bristles from base to apex, e. g., *gilva* (fig. 66)..... 81

Ninth tergum in profile not broadly extended along ventral border, fifth sternum not as above structurally..... 84

81. Thorax largely yellowish, if with cuticular infuscation the areas adjacent and including notopleural callosity yellowish tinged, proboscis yellowish.. 82

Thorax largely darkened or blackish, if with yellowish tinge areas adjacent and including notopleural callosity blackish, opaque, proboscis brownish. 83

82. Mid tibia with a robust anterodorsal bristle, longer than greatest diameter of tibia, prealar bristle over half as long as anterior notopleural bristle, calyptrae whitish ..... *vittigera* (Zetterstedt)

Mid tibia with at most a weakly developed anterodorsal bristle, shorter than greatest diameter of tibia, prealar bristle not more than half length of anterior notopleural bristle, calyptrae yellowish ..... *gilva* (Zetterstedt)

83. Hind femur with anteroventral bristles longish on proximal third, longer than those on proximal half of anterodorsal series, with a series of short fine erect setulae on proximal half of posteroventral surface, mid and hind femora with little if any trace of infuscation at apical region, third antennal segment reddish at base ..... *incisiva* Stein

Hind femur with bristles on proximal third considerably shorter and weaker than those on distal half, with no such series of erect setulae on proximal half of posteroventral surface, mid and hind femora with infuscation on apical region, third antennal segment entirely blackish. *tenera* (Zetterstedt)

84. Cheeks constricted caudad owing to approximation of postgenal margin and caudoventral margin of eye (fig. 94), eyes nearly contiguous, frons not wider than diameter of anterior ocellus 85

Cheeks well produced caudad, owing to the more obtuse curve of postgenal margin (fig. 93), eyes separated by a distance greater than diameter of anterior ocellus, except in *pertusa*..... 91

85. Scutellum with apical setulae hairlike, as those on ventral surface, abdomen viewed from behind with paired brownish fuscous areas on cephalic half of terga 3, 4 and 5, besides the normal dorsocentral marks, processes clothed on inner border with numerous short setulae as in *dissecta*, which are not arranged in series (fig. 61) 86

Scutellum with apical setulae coarser developed than hairs on ventral surface, similar in appearance to those on lateral declivities, abdomen at most with only a dorsocentral mark on terga 3, 4 and 5, processes not as in *dissecta*, setulae or hairs along inner border, if present, arranged in series 87

86. Humeral callosities and scutellum yellowish tinged, hind coxae with a few proximal hairs on caudal surface ..... *rectifrons* Huckett

Humeral callosities and scutellum grayish black, concolorous with mesonotum, hind coxae bare on caudal surface ..... *anabnormis* Huckett

87. Processes pendant and devoid of setulae and bristles except along distal margin where there is a series of short tactile setulae and at base of inner margin where there are two short setulae, basal sclerite densely clothed with short fine setae, calyptrae yellowish, antennae entirely blackish, prosternum with a pair of bristles ..... *tacta* Huckett

Processes clothed with numerous bristles and setulae, apical margin not armed with a series of setulae, basal sclerite with longish setulae and bristles, calyptrae whitish, second antennal segment and base of third yellowish tinged, prosternum bare 88

88. Thorax entirely blackish, including scutellum and humeral callosities, fore femur and fore coxa lightly infuscated ..... *flavipalpis* (Zetterstedt)

Thorax not entirely blackish, with at least some trace of yellowish subcoloration, fore femur and fore coxa entirely yellowish 89

89. Mid tibia with a robust mid anterodorsal bristle, fully as long as or longer than diameter of tibia where situated, hind tibia with three anterodorsal bristles, tarsi brownish or fuscous ..... *pollinosa* Ringdahl

Mid tibia with at most a short mid anterodorsal bristle, shorter than diameter of tibia where situated, hind tibia with two anterodorsal bristles, tarsi yellowish 90

90. Thoracic pleura largely or entirely tinged with diffuse brownish or fuscous coloration, abdominal terga 1+2, 3 and 4 with dark incisures along caudal margin, and frequently largely blackish tinged. ..... *univittata* (von Roser)

Thoracic pleura pale yellow, at most with one or two restricted brownish areas, abdomen with pale incisures along caudal margin of terga 1+2, 3 and 4, frequently terga entirely yellow ..... *geniculata* (Bouché)

91. Costal thorn robust, at least as long as twice breadth of costa, *r–m* and *m–cu* cross veins usually clouded, basal node of veins R_{2+3} and R_{4+5} usually with a few hairs on under surface 92

Costal thorn weak and inconspicuous, if longer than twice breadth of costa *r–m* and *m–cu* cross veins clear and basal node of veins R_{2+3} and R_{4+5} with no hairs on under surface 96

92. Costa with conspicuously long setulae, fully as long as postocular setulae, fore tibia with apical posterodorsal bristle well developed, hind tibia with a robust apical posterodorsal bristle, stronger developed than apical anterodorsal bristle 93

Costa with no conspicuous series of abnormally long setulae, the setulae shorter than postocular hairs, fore tibia with apical posterodorsal bristle weakly developed, setulose 94

93. The long setulae on costa few and widely spaced apart in a sparse series distad of costal thorn, humeral callosities yellowish testaceous, parafacials and cheeks yellowish, fore coxae yellowish, mid femur with no bristle on distal half of anteroventral surface ..... *spinosissima* Stein

The long costal setulae numerous and closely set in a dense series, both proximad and distad of costal thorn, humeral callosities blackish, concolorous with mesonotum, parafacials and cheeks reddish, fore coxae blackish infuscated, mid femur with a bristle on distal half of anteroventral surface ..... *spinigerella* Malloch

94. Scutellum broadly yellowish along lateral declivities, humeral callosities yellowish testaceous, pteropleura with one or more hairs situated dorsad of caudal pair of sternopleural bristles 95

Scutellum largely blackish, yellowish apicad and along ventrocentral plane, lateral declivities blackish, pteropleura bare above caudal pair of sternopleural bristles, humeral callosities grayish black, concolorous with mesonotum ..... *affinis* Stein

95. Third antennal segment largely yellowish, mid tibia with no mid anteroventral bristle, fifth tarsal segment blackish ..... *gopheri* Johnson

Third antennal segment largely blackish, mid tibia with a mid anteroventral bristle, fifth tarsal segment yellowish ..... *finitima* Stein

96. Vibrissae approximated, closer to one another than to nearest point on eye margin, third antennal segment about as long as height of cheek 97

Vibrissae further from one another than distance to nearest point on eye margin, third antennal segment longer than height of cheek 99

97. Third antennal segment entirely black, tarsi yellow, concolorous with tibiae ..... *minuta* Malloch

Third antennal segment yellowish at base, tarsi fuscous or blackish, not concolorous with tibiae 98

98. Third antennal segment with a transverse pale area across base on inner surface, which is scalelike in appearance, processes with a dense series of blackish setulae along inner border at base ..... *ruficeps* Stein

Third antennal segment with but slight indications of a pale scalelike mark on inner surface at base, processes with no such series of setulae along inner border ..... *rufescens* Stein

99. Scutellum entirely yellowish, legs including coxae and tarsi entirely yellowish, fifth sternum amber colored, glossy and devoid of setulae except as a fringe along inner margin of processes, prebasal sclerite with several bristles ..... *cedrica* Huckett

Scutellum and legs in part blackish, prebasal sclerite of hypopygium concealed and bare 100

100. Scutellum and third antennal segment entirely blackish 101
Scutellum and third antennal segment partly reddish tinged 102

101. Processes with a conspicuous series of longish setulae along inner margin, hind tibiae with apical posterodorsal bristle finer developed than apical anterodorsal bristle, eyes closely approximate, separated by about diameter of anterior ocellus ..... *pertusa* Huckett
Processes with no conspicuous series of longish setulae on inner margin, hind tibia with apical posterodorsal bristle as robust as apical anterodorsal bristle, eyes separated by a distance equal to that between posterior ocelli ..... *bicolor* (Wiedemann)

102. Hind tibia with three anterodorsal bristles, apical posterodorsal bristle as robust as apical anterodorsal, processes knobbed and polished apicad, setulae on inner margin confined to basal half, as in *bicolor*. . *triseta* Malloch
Hind tibia with two anterodorsal bristles, apical posterodorsal bristle weaker than apical anterodorsal, processes not thickened nor polished apicad, with a series of longish setae along inner margin, extending to near apex..... ..... *rumicifoliae* nom. nov.

103. Hind femur with a series of ten or more black spinulose setulae along proximal two-thirds of posteroventral surface, hypopygium enlarged as in *gilva* (fig. 66) ..... *rufipes* (Zetterstedt)
Hind femur with no such series of short stout setulae on posteroventral surface, hypopygium not notably enlarged 104

104. Costa bounding cells *Sc.* and $R_{.1}$ becoming noticeably much broader than attenuated section along cell 2 *C.*, abdomen slender, terga clothed with erect longish slender bristles, sterna 2, 3 and 4 elongate, three times as long as wide ..... *lunatifrons* (Zetterstedt)
Costal vein of normal and uniform proportions along cells $R_{.1}$, *Sc.* and 2 *C.*, abdomen robust, terga clothed with shorter discal and stouter marginal bristles, sterna 2, 3 and 4 scarcely more than twice as long as broad respectively 105

105. Both fore and hind tibiae with apical posterodorsal bristle well developed and bristlelike, third antennal segment reddish at base, arista yellowish..... ..... *variegata* Huckett
Either fore or hind tibia, or neither, has a well developed apical posterodorsal bristle, third antennal segment entirely blackish, arista fuscous..... 106

106. Processes with a conspicuous marginal series of bristles and setulae from base to apex, greater part of inner margin protruded mesad as a bare laminate fold, as in *strigipes* Zett., cheeks restricted caudad by the advanced position of postgenal margin ..... *marginata* Huckett
Processes with no bare laminate fold protruded from the greater part of inner margin, apex of processes devoid of setulae, bare, cheeks well maintained caudad owing to the obtuse course of postgenal margin..... 107

107. Fore tibia with mid anterodorsal and apical posterodorsal bristles well developed, bristlelike, fore femur entirely yellow, dorsal bristle of mesopleural series as strong and long as stigmatal bristle below mesothoracic spiracle.. ..... *setaria* (Meigen)

Fore tibia with mid anterodorsal and apical posterodorsal bristles weakly developed, setulose, fore femur with at least trace of infuscation, dorsal bristle of mesopleural series not as well developed as stigmatal bristle..108

108. Prealar bristle absent, hind tibia with two anterodorsal bristles.....109

Prealar bristle present, hind tibia with three or more anterodorsal bristles..110

109. Abdominal terga 4 and 5 with a transverse series of discal bristles, *r–m* cross vein with trace of infuscation, mid femur with a preapical bristle on anterior surface, proboscis slender ..... *cognata* Stein

Abdominal terga 4 and 5 with no transverse series of discal bristles, *r–m* cross vein clear, mid femur with no preapical bristle on anterior surface, proboscis normal ..... *vicaria* Huckett

110. Thorax viewed from behind with four interserial postsutural stripes, lying respectively between the series of acrostical and dorsocentral, dorsocentral and intraalar bristles, scutellum with a dark fascia across base.....111

Thorax and scutellum not so marked in all respects, markings if present along the series of bristles or between the acrosticals.....112

111. Second antennal segment blackish or rufous, face grayish black, concolorous with occiput, inner margin of processes protruded apicad as an angular projection ..... *albimargo* (Pandellé)

Second antennal segment yellowish, face whitish, paler than occiput, apical region of processes rounded ..... *sitiens* Huckett

112. Margin and hairs of calyptrae brownish black, second antennal segment largely black ..... *tinctisquama* Huckett

Margin and hairs of calyptrae whitish or pale yellow.....113

113. Mid tibia with no mid anterodorsal bristle, calyptrae yellowish, scutellum with trace of yellowish tinge on ventral surface ..... *carduorum* Huckett

Mid tibia with a mid anterodorsal bristle, calyptrae whitish, scutellum uniformly blackish.....114

114. Thorax bluish black, palpi reddish proximad, processes with numerous setulae along inner border, parafrontals usually contiguous at middle..*caesia* Stein

Thorax grayish cinereous, palpi entirely fuscous, processes with only a few scattered setulae and no bristles, parafrontals usually narrowly separated at middle ..... *striata* Stein

115. Hind femur with a series of ten or more black spinulose setulae along proximal two-thirds of posteroventral surface ..... *rufipes* (Zetterstedt)

Hind femur with no such series of stout setulae on posteroventral surface..116

116. Scutellum entirely yellow, prebasal sclerite exposed and bristled, legs including coxae and tarsi entirely yellow ..... *cedrica* Huckett

Scutellum not entirely yellow, prebasal sclerite concealed and bare, legs not entirely yellow.....117

117. Hind tibia with apical posterodorsal bristle strongly developed, as long or longer than diameter of tibia where situated 118
Hind tibia with apical posterodorsal bristle weakly developed or setulose, shorter than diameter of tibia where situated 119

118. Third antennal segment entirely black, abdomen reddish as in *triseta*, frequently with more or less blackish subcutaneous areas. *bicolor* (Wiedemann)
Third antennal segment reddish at base, abdomen grayish black with pale incisures along caudal margins of terga as in *affinis*, parafrontals with a pair of minute setulae adjacent anterior ocellus ..... *variegata* Huckett

119. Third antennal segment with a transverse reddish scalelike area at base of inner surface ..... *ruficeps* Stein
Third antennal segment entirely black, at most reddish at extreme base 120

120. Processes shielded laterad by an accessory sclerite which is smooth and tapered caudad, bearing a dense fringe of long curling bristles along inner margin, fore tibia darkened and with two posteroventral bristles .... *alticola* Huckett
Processes not shielded laterad by a conspicuous sclerite, fore tibia with one posteroventral bristle 121

121. Thorax viewed from behind with four interserial stripes, lying between the postsutural series of acrostical and dorsocentral, dorsocentral and intraalar bristles respectively 122
Thorax not so marked, stripes if present lying along the series of bristles or between the acrosticals 123

122. Second antennal segment blackish or rufous, face grayish black, concolorous with occiput, inner margin of processes protruded apicad as a slight angular projection ..... *albimargo* (Pandellé)
Second antennal segment yellowish, face whitish, paler than occiput, apical region of processes rounded ..... *sitiens* Huckett

123. Processes protruded as bare horny plates, armed with a few tactile setulae at apex, basal sclerite shiny and densely clothed with fine short bristles, prosternum armed with a pair of bristles, second antennal segment blackish ..... *tacta* Huckett
Processes not projecting as bare horny plates, clothed with a few setulae and bristles, basal sclerite sparsely clothed with diverse bristles and not shiny, prosternum bare 124

124. Fifth sternum with enlarged basal plate and slender attenuated processes which bear a series of coarse black setulae from base to apex, as in *gilva* (fig. 66), cheeks restricted caudad by approximation of postgenal margin and caudoventral angle of eye ..... *tenera* (Zetterstedt)
Fifth sternum not so enlarged, processes not attenuated, longer than basal plate, setulae not coarse, cheeks nearly as broad as third antennal segment, well maintained caudad owing to obtuse course of postgenal margin 125

125. Abdominal terga 4 and 5 with a transverse series of discal bristles, *r–m* cross vein with trace of infuscation, proboscis slender ..... *cognata* Stein
Abdominal terga 4 and 5 with no transverse series of discal bristles, *r–m* cross vein clear, proboscis not notably slender 126
126. Prealar bristle absent, vibrissae notably approximated, separated by a distance slightly less than height of cheek, smaller species, 4 mm 127
Prealar bristle present, vibrissae separated by a distance slightly greater than height of cheek, larger species, 5 mm 128
127. Second antennal segment dark brownish, ventral sternopleural bristle of caudal pair as long as anterior bristle, mid tibia with no anterodorsal bristle ..... *vicaria* Huckett
Second antennal segment yellowish, ventral sternopleural bristle of caudal pair shorter and finer than anterior bristle, mid tibia with an anterodorsal bristle ..... *minuta* Malloch
128. Mid tibia with no mid anterodorsal bristle, scutellum with trace of yellowish tinge, calyptrae distinctly yellowish ..... *carduorum* Huckett
Mid tibia with a mid anterodorsal bristle, scutellum entirely blackish, calyptrae more or less hyaline, at most with trace of yellowish 129
129. Thorax bluish black, duplicating posthumeral bristle well developed, parafrontals usually contiguous at middle ..... *caesia* Stein
Thorax grayish cinereous, duplicating posthumeral bristle weakly developed or absent, parafrontals usually narrowly separated at middle ..... *hyoscyami* (Panzer)

Females

1. Legs entirely black, at most knees reddish 2
Legs in part yellowish, occasionally tibiae darkened or brownish 14
2. Mid tibia with a mid ventral or anteroventral bristle 3
Mid tibia with no mid ventral or anteroventral bristle 5
3. Antennae separated at base by a prominent rounded facial elevation, propleura with a few hairs near center, apical setulae of scutellum hairlike as those on ventral surface ..... *Paregle aestiva* (Meigen)
Antennae not separated at base by a rounded facial elevation, propleura bare, apical setulae coarser than hairs on ventral surface of scutellum 4
4. Prealar bristle short, second antennal segment with a small wartlike tubercle on dorsal surface, oral margin protruded cephalad ..... *Paregle cinerella* (Fallén)
Prealar bristle long, second antennal segment with no wartlike tubercle on dorsal surface, oral margin not protruded cephalad ..... *analis* Schnabl
5. Arista plumose, hairs sparse and as long as width of third antennal segment, prealar bristle as long as anterior notopleural bristle ..... *palposa* (Stein)

Arista bare or pubescent, hairs not longer than width of third antennal segment, prealar bristle shorter than anterior notopleural bristle.....6

6. Hind tibia with apical posterodorsal bristle well developed, as long as apical anterodorsal bristle, ventral sternopleural bristle of caudal pair weakly developed, palpi slender throughout, frontal vitta entirely velvety black, cruciate bristles well developed, apical setulae of scutellum hairlike..... .....*littoralis* Malloch

Hind tibia with apical posterodorsal bristle weakly developed, not as long as apical anterodorsal bristle, above characters not all present.....7

7. Apical setulae of scutellum hairlike, as those on ventral surface, hind tibia with two anterodorsal bristles.....10

Apical setulae coarser developed than hairs on ventral surface of scutellum, hind tibia with three anterodorsal bristles.....8

8. Cruciate bristles present and well developed, caudal pair of ocellar bristles longish and directed outward, longer than postvertical bristles, fore tibia with anterodorsal bristle weakly developed, ventral bristle of caudal pair of sternopleurals weakly developed, short.....9

Cruciate bristles absent or weakly developed, caudal pair of ocellar bristles short and directed forwards, shorter than postvertical bristles, fore tibia with a strong anterodorsal bristle on distal third, ventral bristle of caudal pair of sternopleurals long and robust.....*rubivora* (Coquillett)

9. Mesonotum bluish gray with three well marked brownish stripes, hind femur with basal bristle on ventral surface longer than width of femur where situated.....*fumipennis* Huckett

Mesonotum brownish gray, the stripes not so well developed, hind femur with basal bristle on ventral surface not longer than width of femur where situated.....*intersecta* (Meigen)

10. Larger species, 5.5 mm., *m–cu* cross vein oblique, scutellum with few accessory setulae on disc.....*cuticornis* Huckett

Smaller species, less than 5 mm., *m–cu* cross vein erect, scutellum with not more than one or two discal accessory setulae.....11

11. Lower sternopleural bristle of caudal pair well developed, longer than posterior notopleural bristle, costal thorn well developed, about equal in length to apical posteroventral bristle of fore tibia, pronotal setulae not spinulose .....*nigroscutellata* (Stein)

Lower sternopleural bristle of caudal pair weakly developed, shorter than posterior notopleural bristle, costal thorn inconspicuous, shorter than length of apical posteroventral bristle of fore tibia, pronotal setulae spinulose in development.....12

12. Cheeks linear, not higher than distance between posterior ocelli, ventral margin of eye reaching a level ventrad of oral vibrissae, parafrontals and parafacials, viewed from above, proportionately narrow, parafacials at narrowest about as wide as distance between posterior ocelli exclusive.... .....*latipalpis* (Stein)

Cheeks proportionately broad, higher than distance between posterior ocelli, ventral margin of eye not reaching a level ventrad of oral vibrissae, parafrontals and parafacials, viewed from above, proportionately broad, parafacials at narrowest wider than distance between posterior ocelli exclusive. 13

13. Mid femur with an uninterrupted series of anterodorsal bristles from base to preapical bristle, hind femur with anteroventral series of bristles extended to proximal half as fine sparse short bristles, series of presutural acrostical bristles seldom separated by a distance as great as that between the respective series of acrostical and dorsocentral bristles..... ..... *pseudodissecta* (Ringdahl)

Mid femur with an interrupted series of anterodorsal bristles, series being deleted for a short distance proximad of preapical bristle, hind femur with proximal third of anteroventral surface devoid of fine bristles, series of presutural acrostical bristles invariably separated by a distance as great as that between the respective series of acrostical and dorsocentral bristles..... ..... *dissecta* (Meigen)

14. Prealar bristle as long as or longer than anterior notopleural bristle..... 15

Prealar bristle shorter than length of anterior notopleural bristle, or absent. 44

15. Mid and hind tarsi with segments 4 and 5 normal and slender in appearance. 16

Mid and hind tarsi with segments 4 and 5 expanded broadly, discoid..... ..... *mallochi* Huckett

16. Thorax largely yellow, abdomen largely blackened..... 17

Thorax largely black..... 18

17. Palpi and second antennal segment yellowish, third antennal segment yellowish at base, frontal vitta entirely reddish..... *labradorensis* Malloch

Palpi fuscous, third antennal segment entirely blackish, second antennal segment largely blackish, frontal vitta blackened on caudal half, reddish cephalad..... *partita* Huckett

18. Fore tarsal segments 3 and 4 at least slightly broader than mid tarsal segments 3 and 4..... 19

Fore tarsal segments 3 and 4 not broader than mid tarsal segments 3 and 4. 27

19. First and second antennal segments reddish..... 20

First and second antennal segments blackish, at most reddish along distal border..... 23

20. Fore tibia with no apical posterodorsal bristle or only weakly developed... 21

Fore tibia with apical posterodorsal bristle well developed..... 22

21. Fore tarsal segments 3 and 4 conspicuously broadened and flattened, maximum breadth of each segment nearly as great as its length, cross veins clear, wings densely yellowish basad..... *lipsia* (Walker)

Fore tarsal segments 3 and 4 each much longer than maximum width, cross veins clouded, wings mostly hyaline basad..... *chrysida* Huckett

22. Fore tarsal segments 3 and 4 inconspicuously enlarged, maximum width not more than half length of third segment, wing membrane clear, abdominal pruinescence grayish drab..... *cresca* Huckett

Fore tarsal segments 3 and 4 conspicuously enlarged, maximum width at least as great as half length of third segment, wing membrane broadly yellowish tinged, abdominal pruinescence densely yellowish..... .....*tarsata* (van der Wulp)

23. Mid femur with a strong bristle on distal half of anteroventral surface....24
Mid femur with no bristle on distal half of anteroventral surface.....26

24. Fore tibia with apical posterodorsal bristle setulose, hind tibia with a bristle on proximal half of posterior surface, mid tibia with a mid anteroventral bristle.....*banffi* Huckett
Fore tibia with apical posterodorsal bristle robust, hind tibia with no bristle on proximal half of posterior surface, mid tibia with no mid anteroventral bristle.....25

25. Base of wings and calyptrae intensively yellowish, mid and hind femora with weakly developed posteroventral bristles, fore tibia frequently with two posteroventral bristles, mesonotum with well marked blackish streak along lateral declivities.....*frigida* (Zetterstedt)
Base of wings and calyptrae hyaline, at most faintly tinged, mid and hind femora with posteroventral bristles robust, fore tibia with one posteroventral bristle, mesonotum with no conspicuous blackish streak along lateral declivities.....*caduca* Huckett

26. Hind tibia with a strongly developed apical posterodorsal bristle, fore femur more or less broadly infuscated proximad, on dorsal and ventral surfaces, mid tibia with a mid anteroventral bristle.....*setiformis* Huckett
Hind tibia with a weakly developed apical posterodorsal bristle, fore femur with infuscation largely confined to a dorsal strip along length of femur, mid tibia with no mid anteroventral bristle.....*fuscicauda* Huckett

27. Arista with longish sparse hairs, longest at least equal in length to half breadth of third antennal segment.....28
Arista bare or with short pubescence, hairs not longer than half breadth of third antennal segment.....29

28. Arista with hairs plumose, longest nearly as long as breadth of third antennal segment, caudal pair of ocellar bristles proportionately short, palpi broadly spatulate, cruciate bristles normally well developed, hind femur with no mid posteroventral bristle.....*juvenilis* (Stein)
Arista with longest hairs scarcely longer than half breadth of third antennal segment, caudal pair of ocellar bristles proportionately long, palpi slender, cruciate bristles at most setulose, hind femur with a mid posteroventral bristle.....*connexa* Stein

29. Posterior notopleural bristle with a few setulae at base, mesopleura with a few setulae on declivity dorsad of mesothoracic spiracle, hind tibia with a well developed bristle at apex of anterior surface, vibrissal angle with numerous (10–12) coarse black setulae.....30

Posterior notopleural bristle with no setulae at base, mesopleural declivity with no setulae dorsad of mesothoracic spiracle, hind tibia with no well developed apical anterior bristle, vibrissal angle with few setulae.....33

30. Mid femur with no bristle on distal half of anteroventral surface.....31
Mid femur with a bristle on distal half of anteroventral surface.....32

31. Second antennal segment blackish, mid and hind femora partly blackish, mid tibia with a weak anteroventral bristle.....*assimilis* Huckett
Second antennal segment reddish, mid and hind femora reddish, mid tibia with no anteroventral bristle.....*major* (Malloch)

32. Parafrontals opposite anterior ocellus with a few inconspicuous setulae.....*thrixia* Huckett
Parafrontals opposite anterior ocellus with no setulae.....*incompleta* (Stein)

33. Wing with *m–cu* cross vein oblique and decidedly sinuate, costal thorn robust, posterior pair of ocellar bristles directed outward and longer than the short bristles caudad of inner pair of vertical bristles, mid femur with a strong bristle at base of anteroventral surface, mid tibia with a mid anteroventral bristle.....34
Wing with *m–cu* cross vein erect and nearly straight, costal thorn not robust, posterior pair of ocellar bristles directed forward and not longer than bristles caudad of inner pair of vertical bristles, mid femur with no strong bristle at base of anteroventral surface, mid tibia with no mid anteroventral bristle, series of presutural acrostical bristles separated by a distance less than width of third antennal segment.....40

34. Mid femur with a strong bristle on distal half of anteroventral surface....35
Mid femur with no bristle on distal half of anteroventral surface.....37

35. Second antennal segment and proximal region of third segment yellowish, palpi largely yellowish, fore femur with infuscation confined to dorsal surface.....*flavicans* (Stein)
Second antennal segment and proximal region of third segment largely blackish, palpi largely blackish or fuscous, fore femur infuscated on dorsal and ventral surfaces proximad.....36

36. Veins intensively yellowish proximad, calyptrae yellowish.....*quadrispinosa* (Malloch)
Veins brownish, calyptrae whitish.....*apicalis* (Stein)

37. Palpi at least fuscous distad, humeral callosities not yellowish testaceous, abdomen black.....38
Palpi largely yellow, faintly tinged at tip, fore tibia with apical posterodorsal bristle setulose, humeral callosities yellowish testaceous, abdomen reddish tinged.....*lividiventris* Huckett

38. Second antennal segment reddish throughout, hind tibia with apical posterodorsal bristle strongly developed, series of presutural acrostical bristles separated by a distance less than width of third antennal segment.....*substriatella* (Malloch)

Second antennal segment largely infuscated, or blackish, hind tibia with apical posterodorsal bristle weakly developed, series of presutural acrostical bristles separated by a distance equal to width of third antennal segment. 39

39. Fore tibia with apical posterodorsal bristle well developed. . . . . *duplicata* (Malloch)

Fore tibia with apical posterodorsal bristle setulose or absent. . . . . *longimana* (Pokorny)

40. Scutellum and third antennal segment entirely blackish. 41

Scutellum and third antennal segment partly yellowish *rumicifoliae* nom. nov.

41. Parafrontals at middle each nearly half as wide as frontal vitta, ovipositor with sclerites strongly chitinized, fuscous and polished, appressed dorsoventrally. . . . . *glabra* (Stein)

Parafrontals at middle each three or four times narrower than frontal vitta, ovipositor weakly chitinized, yellowish, concolorous with fifth tergum, densely setulose. 42

42. Palpi yellow, mesonotum with two pronounced brownish vittae, each being along planes of dorsocentral bristles. . . . . *vanduzeei* Malloch

Palpi entirely or partly fuscous, mesonotum with no pronounced dark vittae 43

43. Abdominal terga largely grayish black, concolorous with thorax, calyptrae yellowish, fore femur infuscated on dorsal and ventral surfaces, hind femur with basal bristle on ventral surface longer than posterior setulae. . . . . *haemorrhoa* (Zetterstedt)

Abdominal terga largely reddish and not concolorous with thorax, calyptrae whitish, fore femur yellowish along ventral surface, hind femur with basal bristle on ventral surface not longer than posterior setulae. . . . . *nigritarsis* (Zetterstedt)

44. Mid and hind tarsi with segments 4 and 5 expanded broadly, discoid in shape 45

Mid and hind tarsi with segments 4 and 5 normal and slender in appearance. 46

45. Palpi entirely yellow, cruciate bristles present, scutellum densely setulose on dorsum. . . . . *winthemi* (Meigen)

Palpi fuscous, cruciate bristles absent, scutellum sparsely setulose on dorsum . . . . . *mallochi* Huckett

46. Palpi entirely yellow. 47

Palpi fuscous, or yellow with apex more or less infuscated. 75

47. Wings with cross veins clouded, sometimes faintly so, basal node of veins R_{2+3} and R_{4+5} with a few setulae on under surface, costal thorn robust and prominent, mid femur with a strong bristle at base of anteroventral surface, prealar bristle absent. 48

Wings with cross veins clear, base of veins R_{2+3} and R_{4+5} bare, costal thorn weakly developed and inconspicuous. 52

48. Hind tibia with apical posterodorsal bristle strongly developed, in length equal to apical anterodorsal bristle, costa with a prominent series of setulae, the latter longer than breadth of costa.....49
Hind tibia with apical posterodorsal bristle weakly developed, finer and shorter than apical anterodorsal bristle, costal setulae short and inconspicuous..50
49. Mid femur with a strong bristle on distal half of anteroventral surface, third antennal segment largely blackish, costal setulae in many instances as long as *r–m* cross vein.....*spinigerella* Malloch
Mid femur with no bristle on distal half of anteroventral surface, third antennal segment largely yellow, costal setulae not as long as *r–m* cross vein.....*spinosissima* Stein
50. Third antennal segment entirely black, fore femur with at least trace of infuscation, scutellum, viewed from below, blackish laterad, with pale yellowish ventrocentral streak, pteropleura with no hairs situated dorsad of caudal pair of sternopleural bristles.....*affinis* Stein
Third antennal segment partly yellowish, fore femur entirely yellow, scutellum broadly yellowish throughout ventral surface, pteropleura usually with one or more hairs situated dorsad of caudal pair of sternopleural bristles, vibrissal angle with only a few setulae near margin.....51
51. Third antennal segment largely yellow, with grayish tinge, mid tibia seldom with a mid anteroventral bristle.....*gopheri* Johnson
Third antennal segment largely black, mid tibia with a mid anteroventral bristle.....*finitima* Stein
52. Lower calyptra protruded beyond margin of upper scale, setulae of humeral callosity and sternopleura golden colored.....*unicolor* Stein
Lower calyptra not extensively protruded beyond margin of upper scale, setulae of humeral callosity and sternopleura blackish.....53
53. Scutellum with apical setulae hairlike as those on ventral surface, palpi conspicuously broadened and flattened distad, maximum breadth equal to distance between posterior ocelli inclusive, costa bounding costal cell almost devoid of setulae on lower surface.....54
Scutellum with apical setulae coarser developed than hairs on ventral surface, or occasionally with no apical setulae, palpi at most gradually broadened distad, maximum width not exceeding distance between posterior ocelli..55
54. Humeral callosity, scutellum and abdomen partly yellowish tinged, hind coxae with one or more hairs on caudal surface proximad, third antennal segment yellowish tinged at base.....*abnormis* Stein
Humeral callosity, scutellum and abdomen grayish drab, concolorous with mesonotum, hind coxae with no hairs on caudal surface proximad, third antennal segment entirely black.....*anabnormis* Huckett
55. Thorax largely blackish, opaque.....56
Thorax largely yellow or reddish yellow, or if mesonotum and pleura are extensively darkened then fore femur has a comparatively stronger bristle among distal bristles of mid posterior series.....70

56. Fore tibia densely infuscated, with two posteroventral bristles, lower surface of costa bare, vibrissal angle and oral margin protruded cephalad, the latter to beneath apex of antennae.....*alticola* Huckett

Fore tibia yellowish, concolorous with mid and hind tibiae, with one mid posteroventral bristle, lower surface of costa with at least a few setulae, oral margin not noticeably protruded cephalad.....57

57. Vibrissae notably approximated, separated by a distance not greater than breadth of frontal vitta at middle, shortest distance between vibrissa and eye margin as long or longer than that separating vibrissae.....58

Vibrissae separated by a distance slightly greater than breadth of frontal vitta at middle, shortest distance between vibrissa and eye margin less than that separating the vibrissae.....60

58. Third antennal segment yellowish at base, tarsi blackish.....59

Third antennal segment entirely blackish, tarsi yellowish....*minuta* Malloch

59. Third antennal segment with transverse pale area on inner side at base, presenting the appearance of an overlapping scale, ventral bristle of caudal pair of sternopleural bristles short and weakly developed, or absent.....*ruficeps* Stein

Third antennal segment with no scalelike yellow mark at base, ventral bristle of caudal pair of sternopleurals well developed, longish....*rufescens* Stein

60. Cruciate bristles present, well developed, presutural acrostical bristles separated by a distance fully as great as that between posterior ocelli inclusive, except in *incisiva*.....61

Cruciate bristles absent, or at most setulose, if present series of presutural acrostical bristles closely adjacent one another, separated by a distance scarcely equal to that between posterior ocelli inclusive.....65

61. Scutellum entirely blackish, second antennal segment largely blackish, calyptrae intensively yellowish, mid femur with a bristle at base of anteroventral surface.....62

Scutellum at least with trace of yellowish, second antennal segment largely reddish yellow, calyptrae at most faintly tinged, mid femur usually with no bristle at base of anteroventral surface.....63

62. Prosternum with two bristles, one on either side, palpi gradually broadened, spatulate, abdomen reddish yellow.....*tacta* Huckett.

Prosternum bare, palpi narrowly thickened, clavate, abdomen blackish.....*unguiculata* Malloch

63. Ventral bristle of caudal pair of sternopleurals longer than half length of dorsal bristle, third antennal segment broadly reddish tinged on proximal half, series of presutural acrostical bristles separated by a distance as great as that between series of acrostical and dorsocentral bristles.....64

Ventral bristle of caudal pair of sternopleurals not longer than half length of dorsal bristle, third antennal segment entirely black, series of presutural acrostical bristles separated by a distance less than that between series of acrostical and dorsocentral bristles.....*incisiva* Stein

64. Hind tibia with three anterodorsal bristles, fore femur with no robust preapical posterior bristle, wings extensively yellowish..... *pollinosa* Ringdahl
Hind tibia with two anterodorsal bristles, fore femur with a comparatively stronger preapical bristle in the posterior series, wings not extensively yellowish tinged..... *flavipalpis* (Zetterstedt)
65. Hind tibia with a strongly developed apical posterodorsal bristle.....66
Hind tibia with apical posterodorsal bristle finer and shorter in development than apical anterodorsal bristle.....67
66. Third antennal segment and scutellum entirely black... *bicolor* (Wiedemann)
Third antennal segment and scutellum partly yellowish..... *triseta* Malloch
67. Scutellum entirely black, mesonotum with a distinctive brownish vitta along planes of dorsocentral bristles..... *vanduzeei* Malloch
Scutellum with trace of yellowish tinge at least, mesonotum with no distinctive brownish vitta along planes of dorsocentral bristles.....68
68. Third antennal segment entirely black, lower sternopleural bristle of caudal pair weakly developed, not as long as anterior sternopleural bristle.....
..... *carduorum* Huckett
Third antennal segment yellowish proximad, lower sternopleural bristle of caudal pair strongly developed, as long as anterior sternopleural bristle .69
69. Thorax bluish black, caudal segment of ovipositor not polished and blackish in color, tarsi black, prosternum with no bristle at anterior angles.....
..... *rumicifoliae* nom. nov.
Thorax grayish black, caudal segments of ovipositor blackish and polished, and fitted as if for piercing, tarsi yellow, prosternum with a bristle at anterior angles..... *cedrica* Huckett
70. Average distance between each series of presutural acrostical bristles at least equal to average distance between each acrostical and dorsocentral series of bristles.....71
Average distance between each series of presutural acrostical bristles decidedly less than average distance between each series of acrostical and dorsocentral bristles.....74
71. Marginal bristles of fifth tergum finely developed laterad, caudal sclerites of ovipositor weakly chitinized, armed with tufts of fine black setulae.....72
Marginal bristles of fifth tergum strongly developed laterad, caudal sclerites of ovipositor strongly chitinized and appressed as if for piercing, with no tufts of black setulae.....73
72. Frontal vitta with caudal half blackened, abdominal terga 1 + 2, 3 and 4 frequently with blackish or purplish incisures along caudal margin, and with the intervening conjunctival membrane stiffly chitinized and appearing frequently as a glabrous extension of the caudal margin.....
..... *univittata* (von Roser)
Frontal vitta entirely yellowish or with caudal half purplish or darkened, abdominal terga 1 + 2, 3 and 4 with pale incisures or concolorous, and with

no platelike extension along caudal margin of tergum owing to the stiffening of the conjunctival membrane ..... *geniculata* (Bouché)

73. Basal tergum of ovipositor yellowish, opaque, armed with a robust series of bristles along caudal margin, hind tibia with usually two anterodorsal bristles, cruciate bristles present, hind femur with anteroventral series of bristles extended to proximal region ..... *flavipalpis* (Zetterstedt)

Basal tergum of ovipositor blackish, shining, armed with a series of fine weak bristles along caudal margin, hind tibia with usually three anterodorsal bristles, cruciate bristles absent, hind femur with anteroventral series of bristles restricted to distal region, proximal half bare ..... *pilosa* Stein

74. Ocellar triangle strongly shining and polished, mesonotum and abdominal terga relatively shiny, as on proboscis, fore femur with no comparatively stronger developed preapical posterior bristle, mesopleura rarely with distinctively developed bristle on upper margin adjacent anterior notopleural bristle ..... *vittigera* (Zetterstedt)

Ocellar triangle largely pollinose, not polished, mesonotum and abdominal terga not as shiny as proboscis, fore femur with a comparatively stronger developed preapical bristle in the posterior series, mesopleura invariably with a distinct short bristle on upper margin adjacent anterior notopleural bristle ..... *gilva* (Zetterstedt)

75. Hind tibia with only one dorsal or posterodorsal bristle, which is situated at middle, apical dorsal bristle not developed ..... *solitaria* Stein

Hind tibia with two or more posterodorsal bristles, apical dorsal bristle present 76

76. Wings with cross veins clouded, basal node of veins R_{2+3} and R_{4+5} with a few minute setulae on under surface, costal thorn robust and prominent, mid femur with a strong bristle at base of anteroventral surface.. *affinis* Stein

Wings with cross veins clear, basal node of veins R_{2+3} and R_{4+5} bare on under surface 77

77. Scutellum with apical setulae hairlike as those on ventral surface, abdomen blackish, with a dorsocentral vitta, and trace of paired brownish fascia on anterior half of terga 3, 4 and 5, antennae and palpi largely blackish, the latter conspicuously broadened, cruciate bristles well developed ..... *acutipennis* Malloch

Scutellum with apical setulae coarser developed than hairs on ventral surface, abdomen at most with only trace of dorsocentral vitta 78

78. Tibial bristles fine and weakly developed, mid tibia with no mid anterodorsal bristle and with only one bristle on posterior surface ..... *lunatifrons* (Zetterstedt)

Tibial bristles well developed, mid tibia with a mid anterodorsal bristle and with two or more bristles on posterior surface 79

79. Palpi broadly expanded and enlarged, maximum breadth greater than length of palpal setulae 80

Palpi narrowly expanded distad and not enlarged, maximum breadth not greater than length of palpal setulae....82

80. Cruciate bristles present, caudal pair of ocellar bristles longish and directed outward, wing membrane yellowish tinged....81

Cruciate bristles absent, caudal pair of ocellar bristles short and directed forward, wing membrane densely brownish tinged....*marginata* Huckett

81. Abdomen reddish, *m–cu* cross vein erect and sinuate, fore and middle tibiae brownish fuscous....*palpata* Stein

Abdomen brownish to grayish drab, *m–cu* cross vein slightly oblique, straight, fore and middle tibiae yellowish....*tinctisquama* Huckett

82. Third antennal segment yellowish basad....83

Third antennal segment entirely blackish....84

83. Third antennal segment with yellowish portion confined to a well defined scalelike appearance at base on inner surface, vibrissae approximated, separated by a distance not greater than average width of frontal vitta, hind tibia with apical posterodorsal bristle setulose....*ruficeps* Stein

Third antennal segment with no distinct demarkation restricting the yellowish area, vibrissae separated by a distance greater than average breadth of frontal vitta, hind tibia with apical posterodorsal bristle robust....*variegata* Huckett

84. Scutellum at least distinctly yellowish in part, if tinged with fuscous lateral declivities are yellowish....85

Scutellum blackish, if faintly reddish tinged in part along dorsocentral plane or at apex lateral declivities black....88

85. Marginal bristles of fifth abdominal tergum well developed, similar to those of fourth tergum, fore tibia with a distinct mid anterodorsal bristle, ovipositor heavily chitinized, blackish, polished, and sharply tapering caudad as if for piercing, acrostical bristles well developed, in well set paired series, humeral callosities yellowish....86

Marginal bristles of fifth tergum weakly developed, weaker than those on fourth tergum, ovipositor weakly chitinized as in *hyoscyami*, not for piercing, acrostical bristles weakly developed in two adjacent series, humeral callosities blackish....*carduorum* Huckett

86. Hind femur with anteroventral bristles restricted to distal region, proximal half noticeably bare, hind tibia invariably with three anterodorsal bristles....*pilosa* Stein

Hind femur with anteroventral series of bristles extending to proximal region, hind tibia invariably with two anterodorsal bristles....87

87. Basal tergum of ovipositor yellowish, opaque, armed along caudal margin with robust bristles, cruciate bristles present, fore femur uniformly fuscous tinged on proximal and distal regions....*tenera* (Zetterstedt)

Basal tergum of ovipositor blackish, shining, armed along caudal margin with fine weak bristles, cruciate bristles usually absent, fore femur largely yellow, fuscous area restricted to apical region of dorsum....*rufipes* (Zetterstedt)

88. Abdomen blackish, concolorous with mesonotum, occasionally reddish testaceous in part or of paler hue along caudal margins of terga, if reddish, acrostical bristles setulose and in two adjacent series.....89

Abdomen reddish, mesonotum blackish, abdomen occasionally with more or less integumentary darkening, or with blackish incisures along caudal margins of terga, if blackish, acrosticals well developed and widely separated between the series.....100

89. Fore tibia with apical posterodorsal bristle well developed, fore femur entirely yellow, mid tibia with two short bristles on proximal half of posterior surface, caudal intraalar bristle as long as caudal dorsocentral bristle.....*setaria* (Meigen)

Fore tibia with apical posterodorsal bristle weakly developed or setulose, mid tibia with less than two bristles on proximal half of posterior surface, fore femur partly infuscated, caudal intraalar bristle shorter than caudal dorsocentral bristle.....90

90. Mid and hind femora extensively infuscated throughout proximal and distal regions, darker than their respective tibiae.....91

Mid and hind femora concolorous with tibiae, yellowish, at most with trace of fuscous areas on distal half.....94

91. Presutural series of acrostical bristles as widely spaced apart as distance between respective series of acrostical and dorsocentral bristles, with setulae between the series of acrostical bristles, antennae relatively large, reaching a level with oral margin.....*longicornis* Huckett

Presutural series of acrostical bristles closer to one another than to their respective series of dorsocentral bristles, with invariably no setulae between series of acrostical bristles, antennae not abnormally large, apex not reaching level of oral margin.....92

92. Second antennal segment entirely yellow, vibrissae closely approximated, distance between them not as great as shortest distance between vibrissae and eye margin, fore tibia with no mid anterodorsal bristle.....*convergens* Huckett

Second antennal segment at least partly infuscated, distance between vibrissae as great as that between vibrissae and eye margin, fore tibia with a mid anterodorsal bristle.....93

93. Thorax and abdomen with a well marked brownish dorsocentral vitta, parafacials and cheeks largely whitish pruinescent, with trace of subfuscous reflections, fifth abdominal tergum with no erect discal setae, proboscis short and fleshy.....*atlanis* Huckett

Thorax and abdomen with no dorsocentral vitta, abdomen at most with an ill-defined dorsocentral marking, parafacials and cheeks reddish, with trace of whitish pruinescence, fifth abdominal tergum with a few erect discal setae, proboscis normal.....*flavifrons* (Walker)

94. Prealar bristle absent 95
Prealar bristle present 97
95. Palpi entirely and uniformly fuscous, second antennal segment dark brown or black, mesonotum with brownish dorsocentral streaks ..... *vicaria* Huckett
Palpi paler proximad, not uniformly fuscous, second antennal segment yellowish, mesonotum with no brownish dorsocentral streaks 96
96. Tarsi yellow, concolorous with tibiae, humeral callosity yellowish testaceous, ventral bristle of caudal pair of sternopleurals short and weakly developed, fifth tergum with no discal series of stout bristles, *r–m* cross vein clear ..... *minuta* Malloch
Tarsi brownish, darker than tibiae, humeral callosities grayish black, ventral bristle of caudal pair of sternopleurals stoutly developed, about as long as anterior bristle, fifth tergum with a discal series of stoutish bristles, *r–m* cross vein with trace of infuscation ..... *cognata* Stein
97. Parafrontals at middle nearly half as wide as interfrontalia, ovipositor appressed strongly dorsoventrad, glossy and blackish, fifth tergum longer than fourth, ventral bristle of caudal pair of sternopleurals nearly as long as anterior sternopleural bristle ..... *glabra* (Stein)
Parafrontals at middle not broader than one third width of interfrontalia, ovipositor not in all respects as above, fifth tergum not longer than fourth, ventral bristle of caudal pair of sternopleurals weaker and shorter than anterior bristle 98
98. Fore tibia densely infuscated, with two posteroventral bristles, lower surface of costa bare on proximal half, cruciate bristles present, second antennal segment blackish ..... *alticola* Huckett
Fore tibia yellow, with one posteroventral bristle, lower surface of costa setulose, cruciate bristles absent, second antennal segment yellow 99
99. Marginal bristles of fifth tergum as strongly developed as those on fourth tergum, calyptrae at most with trace of yellowish tinge ..... *hyoscyami* (Panzer)
Marginal bristles of fifth tergum weaker developed than those on fourth, calyptrae decidedly yellowish tinged ..... *carduorum* Huckett
100. Lower calyptra notably protruded beyond margin of upper, series of presutural acrostical bristles more widely separated from one another than from the nearest series of dorsocentral bristles, with setulae between acrostical series, antennae black ..... *rufina* (Fallén)
Lower calyptra not noticeably protruded beyond margin of upper, series of presutural acrostical bristles not more widely separated from one another than from nearest series of dorsocentral bristles, second antennal segment reddish or reddish brown 101
101. Parafrontals at middle nearly half as wide as interfrontalia, ovipositor strongly appressed dorsoventrad, terminal sclerites blunt and rounded on caudal margin, fifth tergum longer than fourth ..... *glabra* (Stein)

Parafrontals at middle not more than one third width of interfrontalia, ovipositor not strongly appressed dorsoventrad, tapering and not as above, fifth tergum not longer than fourth 102

102. Third antennal segment large and broad, reaching oral margin, cruciate bristles present, presutural acrostical bristles well developed, bristlelike.. ..... *caesia* Stein

Third antennal segment not large and broad, not reaching oral margin, cruciate bristles absent, presutural acrostical bristles not robust..... 103

103. Ventral sternopleural bristle of caudal pair longish, equal to three-quarters length of dorsal bristle, prealar bristle longer than posterior notopleural bristle, calyptrae whitish..... *nigritarsis* (Zetterstedt)

Ventral bristle of caudal pair of sternopleurals short, not longer than half length of dorsal bristle, prealar bristle not longer than posterior notopleural bristle, calyptrae tinged..... 104

104. Fore tibia with no mid anterodorsal bristle, mesonotum cinereous gray.... ..... *carduorum* Huckett

Fore tibia with a mid anterodorsal bristle, mesonotum bluish black .... *sitiens* Huckett

Pegomyia analis Schnabl

Pegomyia (*Anthomyia*) *analis* Schnabl, Mém. Acad. Sci. Petrograd, sér. 8, XXVIII, no. 7, p. 18, 1915.

Pegomyia analis Ringdahl, Skrifter om Svalbard og Ishavet, no. 53, p. 18, 1933. Séguy, Gen. Insect., fasc. 205, p. 52, 1937.

I have not seen this species, which is recorded by Ringdahl as occurring on the east coast of Greenland. He mentions that his *Chortophila alpina* is probably the same species and that both may eventually be found to be identical with *Anthomyza tunicata* Zetterstedt. Mr. Ringdahl informs me that the species may be distinguished from related forms by the blackish tibiae and by the presence of a bristle on anteroventral surface of mid tibia.

Pegomyia palposa (Stein) (Figs. 1, 30, 54.)

Hydrophoria palposa Stein, Entom. Nachr., XXIII, p. 320, 1897. Stein, Arch. f. Naturgesch., (1913), LXXIX, (A), hft. 8, p. 31, 1914.

Pegomyia (*Pegoplata*) *palpata* Schnabl and Dziedzicki, Abh. K. Leop.-Carol. Deutsch. Akad. Naturforsch., XCV, nr. 2, p. 109, 1911. Séguy, Gen. Insect., fasc. 205, p. 50, 1937.

Pegomyia palposa Stein, Arch. f. Naturgesch., (1915), LXXXI, (A), hft. 10, p. 130, 1916. Séguy, Gen. Insect., fasc. 205, p. 61, 1937.

Pegomyia (*Pegoplata*) *palposa* Séguy, Faune de France, VI, p. 149, 1923.
Hydrophoria orientalis Huckett, Mem. 77, N. Y. (Cornell) Agr. Exp. Station, (1923), p. 16, 1924. Huckett, Mem. 101, N. Y. (Cornell) Agr. Exp. Station, (1926), p. 837, 1928. Séguy, Gen. Insect., fasc. 205, p. 134, 1937.
Pegomyza palposa Karl, Tierwelt Deutschlands, XIII, pt. 3, p. 121, 1928.

The species resembles *Pegomyia virginea* (Meigen), from which it differs slightly in the larger development of lower calyptral scale, shorter length of prealar bristle, and weaker development of apical posterodorsal bristle of hind tibia. In *virginea* the lower calyptral scale does not protrude beyond margin of upper, prealar bristle is comparable in length to the first intraalar bristle, and apical posterodorsal bristle of hind tibia is as long as apical anterodorsal bristle. The basal sclerite of hypopygium in male of both species is shining black as in *juvenilis*, but the legs are largely black and not yellow as in the latter species. The related form *virginea* is listed by Séguy (1937) as occurring in North America, a record I hesitate to accept without further corroborative evidence.

NEW YORK: 1 ♂, Riverhead, Long Island, August 18 1923, *type*, [C. U.]. 5 ♀, same locality, July 3 1927; 2 ♂, Wading River, Long Island, May 17 1923, (H. C. Huckett), [H. C. H.].

Pegomyia intersecta (Meigen) (Figs. 2, 31, 55.)

Anthomyia intersecta Meigen, Syst. Beschr., V, p. 175, 1826.
Phorbia neglecta Meade, Ent. Month. Mag., XIX, p. 219, 1883.
Chortophila quintilis Pandellé, Rev. Ent. France, XIX, p. 253, 279, 1900.
Pegomyia (*Anthomyia*) *intersecta* Schnabl and Dziedzicki, Abh. K. Leop.-Carol. Deutsch. Akad. Naturforsch., XCV, nr. 2, p. 111, 1911.
Chortophila intersecta Stein, Arch. f. Naturgesch., (1915), LXXXI, (A), hft. 10, p. 190, 1916.
Chortophila (*Chortophila*) *intersecta* Séguy, Faune de France, VI, p. 129, 1923.
Chortophila (*Nudaria*) *intersecta* Karl, Tierwelt Deutschlands, XIII, pt. 3, p. 174, 1928.
Hylemyia (*Nupedia*) *intersecta* Ringdahl, Kongl. Svensk. Vetenskap. Akad. Skrift. Naturskyddsär., nr. 18, (3), p. 20, 1931. Ringdahl, Ent. Tidskr., LIV, (1), p. 33, 1933. Tiensuu, Acta Soc. Faun. Flor. Fennica, LVIII, (4), p. 20, 1935.
Hylemyia (*Nupedia*) *intersecta arctica* Ringdahl, Skrifter om Svalbard og Ishavet, LIII, p. 16, 1933.

The species *intersecta* closely resembles the North American form *unguiculata* Malloch in structure and chaetotaxy, differing in that the palpi and legs are black and not yellow. In the male

of both species the hypopygium is shining black and the processes are of hornlike texture, devoid of bristles and terminating distad in a digitlike appendage. The female of *intersecta* possesses cruciate bristles and differs from females of the *dissecta*-group in having apical setulae of scutellum coarser in development than hairs on ventral surface.

The specimens before me apparently agree closely with Ringdahl's conception of the smaller darker circumpolar variety *arctica*.

ALBERTA: 2 ♂, Banff, July 14 1922; 1 ♂, July 13 1922, (C. B. D. Garrett); 1 ♂, Nordegg, July 5 1921, (J. McDunnough); 1 ♂, Waterton, July 2 1924, (H. L. Seamans), [C. N. C.].

BRITISH COLUMBIA: 1 ♂, Hedley, July 3 1923, (C. B. D. Garrett); 1 ♀, Invermere, July 28 1926; 1 ♀, Fairmont, July 28 1926, (A. A. Dennys), [C. N. C.].

CALIFORNIA: 1 ♂, Monrovia Canyon, February 17 1935, (M. W. Stone), [J. Wilcox].

IDAHO: 1 ♂, Paradise Ridge, Moscow, May 17 1930, 3000 ft. alt. (Paul Rice), [H. C. H.].

MONTANA: 2 ♀, Gallatin County, Aug. 15 1912, 5400 ft. alt.; 1 ♂, Pipestone Pass, July 29 1923, (A. L. Melander); [A. L. M.].

OREGON: 2 ♀, Aneroid Lake, Blue Mts., 7500 ft. alt., July 23 1929, (H. A. Scullen); [H. C. H.].

UTAH: 1 ♂, Card Canyon, Logan Canyon, July 24 1938, (W. P. Nye), [Utah Agr. Col.].

Pegomyia littoralis Malloch (Figs. 4, 33, 57.)

Pegomyia littoralis Malloch, Bull. Brooklyn Ent. Soc., XV, no. 5, p. 127, 1920. Huckett, Mem. 77, N. Y. (Cornell) Agr. Exp. Station, (1923), p. 45, 1924. Johnson, Occ. Pap. Boston Soc. Nat. Hist., VII, p. 232, 1925. Frison, Bull. Ill. Nat. Hist. Surv., XVI, art. 4, p. 206, 1927. Johnson, Insect Fauna, Biol. Surv. Mt. Desert Region, p. 210, 1927. Huckett, Mem. 101, N. Y. (Cornell) Agr. Exp. Station, (1926), p. 840, 1928. Séguy, Gen. Insect., fasc. 205, p. 59, 1937.

The species superficially resembles *Prosalpia sepiella* (Zetterstedt), differing in that the male lacks the fringe of longish setulae on posteroventral surface of hind metatarsus in *sepiella*. The females of the two species are scarcely distinguishable. Despite the hind tibial characters possessed by *littoralis* that denote its relationship to *Pegomyia* it has not been possible to go further and link the species with any group within the genus. Its closest affinities seem to be placed elsewhere as indicated by its resemblance to *sepiella*.

MAINE: 2 ♂, Bar Harbor, July 21 1919, (C. W. Johnson), [H. C. H.]

NEW HAMPSHIRE: 1 ♂, Mount Cadillac, Mt. Desert, July 25 1919, (C. W. Johnson). *Holotype*, [N. E. M. N. H.]. 1 ♂, Noxon Camp, 2000 ft. alt., July 5 1931, (J. M. Aldrich), [U. S. N. M.]. 1 ♂, Franconia Notch, July 8 1931; 1 ♂, Lost River, July 7 1931, (A. L. Melander), [A. L. M.].

NEW YORK: 1 ♂, Wilmington Notch, Adirondacks, July 2 1922, (J. M. Aldrich), [U. S. N. M.]. 2 ♂, Old Forge, July 6 1905; 2 ♀, August 2 1905, [N. Y. State Coll.].

Pegomyia cuticornis Huckett

Pegomyia cuticornis Huckett, Trans. Amer. Ent. Soc., LXV, p. 18, 1939.

The species *cuticornis* belongs to the *dissecta*-group. It may invariably be distinguished from group forms by its larger size and oblique course of *m–cu* cross vein, and from dark-legged forms in other groups by the hairlike nature of the apical setulae on scutellum.

ALBERTA: 2 ♀, Banff, August 2 1922, 7000 ft. alt.; 2 ♀, September 11 1922, (C. B. D. Garrett), [C. N. C.]

BRITISH COLUMBIA: 1 ♂, 1 ♀, Hedley, July 20 1923, (C. B. D. Garrett), *Type* and *allotype*, [C. N. C.]. 1 ♀, Hedley, Aug. 29 1923, (C. B. D. Garrett), *Paratype* [A. N. S. P.]. 1 ♀, Glacier, July 20 1901, [H. C. H.].

COLORADO: 2 ♀, Trail Ridge Pass, 12,100 ft. alt., August 23 1936, (C. L. Fluke), [Univ. Wisc.].

Pegomyia pseudodissecta (Ringdahl) (Figs. 6, 34, 62.)

Hylemyia pseudodissecta Ringdahl, Ent. Tidskr., XLVII, hft. 2, p. 111, 1926. Ringdahl, Trømso Museums Årsheft., (1926), XLIX, hft. 3, p. 41, 1928. Séguy, Gen. Insect., fasc. 205, p. 108, 1937.

Hylemyia (*Nupedia*) *pseudodissecta* Ringdahl, Svensk. Veten. Akad. Skrift. Naturskyd., nr. 18, p. 20, 1931. Ringdahl, Ent. Tidskr., LIV, hft. 1, p. 33, 1933. Tiensuu, Acta Soc. Faun. Flor. Fennica, LVIII, no. 4, p. 20, 1935.

The male of *pseudodissecta* may be distinguished from related forms by the presence of long slender bristles on proximal half of antero- and posteroventral surfaces of hind femur; as in *dissecta* the sternopleural setulae have a tendency to curve upwards at tip. In the female the species differs from *dissecta* in that there are invariably one or two fine short bristles on proximal third of anteroventral surface of hind femur and the presutural series of acrostical bristles are seldom separated by a distance as great as that between the respective series of acrostical and dorsocentral

bristles. Comparative studies have been based on a large series of specimens collected in Swedish Lappland.

ALASKA: 4 ♂, 7 ♀, Kodiak, June 1917, (Jas. S. Hine), [Ohio State Univ.].

Pegomyia dissecta (Meigen)

Anthomyia dissecta Meigen, Syst. Beschr., v, p. 176, 1826. Nehaus, Dipt. Marchica, p. 231, 1886.

Chortophila dissecta Stein, Kat. Paläark. Dipt., III, p. 715, 1907. Ringdahl, Ent. Tidskr., XXXV, hft. 3–4, p. 154, 1914. Stein, Zool. Jahrbüch., XXXIX, hft. 1, p. 137, 1915. Stein, Arch. f. Naturgesch., (1913), LXXIX, (A), hft. 8, p. 40, 1915. Stein, Arch. f. Naturgesch., (1915) LXXXI, (A), hft. 10, p. 185, 1916. Huckett, Ann. Ent. Soc. Amer., XIV, no. 4, p. 300, 1921.

Egle dissecta Schnabl, Deutsch. Ent. Zeitschr., hft. 6, p. 81, 1911. Schnabl and Dziedzicki, Abh. K. Leop.-Carol. Deutsch. Akad. Naturforsch., XCV, nr. 2, p. 105, 1911.

Egle dissecta tundrica Schnabl, Mém. Acad. Sci. Petrograd, sér. 8, XXVIII, no. 7, p. 17, 1915.

Phorbia dissecta Bequaert, The Bryologist, XXIV, no. 1, p. 2, 1921.

Hylemyia (*Chortophila*) *dissecta* Séguy, Faune de France, VI, p. 125, 1923.

Pegomyia dissecta Huckett, N. Y. (Cornell) Agr. Exp. Station, Mem. 77, (1923), p. 44, 1924. Huckett, Mem. 101, N. Y. (Cornell) Agr. Exp. Station, (1926), p. 840, 1928. Johnson, Insect Fauna, Biol. Surv. Mt. Desert Region, (1927), p. 209, 1928.

Chortophila (*Nudaria*) *dissecta* Karl, Tierwelt Deutschlands, XIII, pt. 3, p. 172, 1928.

Hylemyia dissecta Ringdahl, Trømso Museums Årshefter, (1926), XLIX, hft. 3, p. 40, 1928. Ringdahl, Arkiv Zool., XXI, (A), no. 20, p. 5, 1930. Séguy, Gen. Insect., fasc. 205, p. 89 and 455, 1937.

Hylemyia (*Nupedia*) *dissecta* Ringdahl, Kongl. Svensk. Veten. Akad. Skrift. Naturskyddsärenden, nr. 18, p. 20, 1931. Ringdahl, Ent. Tidskr., LIV, hft. 1, p. 33, 1933. Tiensuu, Acta Soc. Faun. Flor. Fennica, LVIII, hft. 4, p. 20, 1935.

Nupedia dissecta Collin, Ent. Month. Mag., LXXV, p. 147, 1939.

The male of *dissecta* closely resembles that of *nigroscutellata* and *latipalpis*. I have distinguished it from the latter species by the fact that when the mesonotum is viewed from behind the three broad vittae appear to extend caudad to base of scutellum, by the presence of coarse stiffened black setulae on mid ventral region of head between the oral cavity and occipital foramen, and by the proportionately finer development of anterior sternopleural bristle when compared with the ventral bristle of caudal pair. In *nigro-*

scutellata and *latipalpis* the mesonotal area cephalad of scutellum is largely pruinescent and lacks three broad vittae when viewed from behind, the setulae caudad of oral cavity are fine, curved and pointed, and the cephalic bristle of sternopleural series is as robust as the ventral bristle of caudal pair.

Structurally the female of *dissecta* resembles more closely that of *pseudodissecta* than those of *nigroscutellata* and *latipalpis* in that the width of parafacial at middle when viewed from above is about equal to half length of third antennal segment, and the setulae caudad of oral cavity are coarse and spinulose. In *nigroscutellata* and *latipalpis* the parafacials at middle are narrower and the setulae are finer developed. In *pseudodissecta* the hind femur has one or two fine bristles on proximal third of anteroventral surface, which are seldom present in the female of *dissecta*.

NEWFOUNDLAND: 1 ♂, Carbonier, August 2 1925, (J. M. Swaine), [C. N. C.].

NEW HAMPSHIRE: 1 ♀, Halfway House to Gorham, July 20 1935, (F. S. Blanton), [H. C. H.]. 2 ♂, Benton, July 6 1931; 2 ♂, Alpine Garden, Mount Washington, July 11 1931, (A. L. Melander), [A. L. M.].

NEW YORK: 2 ♂, 2 ♀, McLean Bogs, McLean, May 7 1922; 1 ♂, 2 ♀, August 18 1928, 1 ♂, Ringwood near Ithaca, July 13 1920, (H. C. Huckett), [H. C. H.].

ONTARIO: 1 ♂, Lyn, July 9 1926, (C. H. Curran); 1 ♂, Ottawa, May 23 1927; 1 ♀, Whitby, July 6 1926; 2 ♂, Niagara Glen, June 9, 1926, (G. S. Walley), [C. N. C.].

QUEBEC: 1 ♀, Kazubazua; June 6–10 1927; 1 ♀, Covey Hill, June 27 1927, (W. J. Brown), [C. N. C.].

VERMONT: 40 ♂, 3 ♀, Peak Mountain, Mansfield, July 17 1935; 1 ♀, Mount Equinox, July 15 1935; 1 ♀, near West Rupert, July 14 1935; 1 ♀, Middlebury, July 16 1935, (F. S. Blanton), [H. C. H.].

Pegomyia latipalpis (Stein)

Chortophila latipalpis Stein, Arch. f. Naturgesch., (1918), LXXXIV, (A), hft. 9, p. 89, 1920.

Hylemyia (*Nupedia*) *latipalpis* Ringdahl, Ent. Tidskr., LIV, hft. 1, p. 33, 1933. Tiensuu, Acta Soc. Faun. Flor. Fennica, LVIII, no. 4, p. 20, 1935.

Hylemyia latipalpis Séguy, Gen. Insect., fasc. 205, p. 99, 1937.

Nupedia latipalpis Collin, Ent. Month. Mag., LXXV, p. 148, 1939.

Structurally the male of *latipalpis* most closely resembles that of *nigroscutellata*, as has already been indicated in the discussion of *dissecta*. The males of *latipalpis* have the eyes proportionately

larger than is the case in *nigroscutellata*, the eye margin impinging more noticeably on parafacials, the palpi are more extensively flattish, and the thorax is deep brownish black with dense brownish pruinescence, whereas in *nigroscutellata* the thorax is more highly grayish pruinescent. In chaetotaxy I find the species to differ as indicated in the key.

The female of *latipalpis* may be distinguished from that of *nigroscutellata* by the weaker development of ventral sternopleural bristle of caudal pair, and by the spinulose nature of the setulae across cephalic border of mesonotum; and from that of *dissecta* by the narrower parafacials and cheeks and by the more normal finer appearance of the setulae on mid ventral region of occiput, between oral cavity and occipital foramen.

ALASKA: 1 ♂, Anchorage, June 11 1921, (J. M. Aldrich), [U. S. N. M.].
ALBERTA: 1 ♂, Waterton, July 14 1923, (H. L. Seamans), [C. N. C.].
BRITISH COLUMBIA: 1 ♀, Keremeos, June 22 1923; 1 ♀, June 20 1923, (C. B. D. Garrett), [C. N. C.].
MICHIGAN: 1 ♂, Isle Royale, August 3–7 1936, (C. W. Sabrosky), [Mich. State Coll.].
ONTARIO: 1 ♀, Low Bush, Lake Abitibi, June 18 1925, (N. K. Bigelow), [C. N. C.]
WASHINGTON: 1 ♂, Longmire's Springs, Mount Rainier, Aug. 2 1905, *type*, [Z. M. U. B.].

Pegomyia nigroscutellata (Stein) (Figs. 5, 36, 60.)

Chortophila nigroscutellata Stein, Arch. f. Naturgesch., (1918), LXXXIV, (A), hft. 9, (May), p. 90, 1920.
Pegomyia slossonae Malloch, Bull. Brooklyn Ent. Soc., XV, no. 5, (Dec.), p. 127, 1920. Johnson, Occ. Pap. Boston Soc. Nat. Hist., no. VII, p. 232, 1925. Séguy, Gen. Insect., fasc. 205, p. 63, 1937.
Hylemyia nigroscutellata Séguy, Gen. Insect., fasc. 205, p. 105, 1937.

The markings on the thorax and abdomen of male exhibit a large amount of variation, thus giving to these parts a paler or darker aspect. However in all cases the scutellum when viewed from behind is entirely black and somewhat glossy, showing up in marked contrast to the paler drab pruinescence on mesonotum when apparent. The female, as represented, differs nost notably from that of allied species in having the ventral sternopleural bristle of caudal pair relatively well developed, being longer than posterior notopleural bristle.

ALASKA: 2 ♀, Katmai, July 1917, (J. S. Hine).

ALBERTA: 1 ♂, Waterton, July 15 1923, (H. L. Seamans), [C. N. C.]. 1 ♀, Edmonton, May 24 1936; 1 ♀, August 20 1936, (E. H. Strickland), [Univ. Alberta].

MICHIGAN: 2 ♀, Isle Royale, August 3–7 1936, (C. W. Sabrosky), [Mich. State Coll.].

NEW HAMPSHIRE: 1 ♂, Mount Washington, 2500 ft. alt., June 14 1916, (C. W. Johnson), *Type* of *slossonae*, [N. E. M. N. H.].

NEW YORK: 1 ♂, McLean Bogs, McLean, May 7 1922; 1 ♂, Wading River, Long Island, May 17 1925; 1 ♀, Ellis Hollow, near Ithaca, May 24 1922, (H. C. Huckett); [H. C. H.].

ONTARIO: 3 ♂, Low Bush, Lake Abitibi, June 8 1925; 1 ♂, June 4 1925; 3 ♂, June 6 1925; 1 ♀, June 2 1925, (N. K. Bigelow); [C. N. C.].

QUEBEC: 1 ♂, Cottage Beaulieu, July 16 1906; [C. N. C.].

SOUTH DAKOTA: 1 ♂, Hot Springs, July 13 1924, [H. C. H.].

VERMONT: 1 ♂, near West Rupert, July 14 1935, (Blanton & Borders), [H. C. H.].

WASHINGTON: 6 ♂, Electron, May 7 1935, (J. Wilcox), [H. C. H.]. 1 ♂, Monroe, May 20 1908, *cotype* of *nigroscutellata*, [Z. M. U. B.].

WISCONSIN: 1 ♂, Dane County, May 17 1937, (Fred Snyder), [Univ. Wisc.].

Pegomyia fumipennis Huckett

Pegomyia fumipennis Huckett, Trans. Amer. Ent. Soc., LXV, p. 20, 1939.

This is a dark *Chortophila*-like species, which I am unable to associate with any group as herein defined. Superficially it resembles species of the *dissecta*-group, differing in that apical setulae of scutellum are coarsely developed, processes of male are structurally different in character, and in female the caudal pair of ocellar bristles is longish and directed outwards. The species differs from the *rubivora*-group in the characters of hypopygium and ovipositor. The female of *fumipennis* resembles that of *intersecta*. Further characters for the recognition of the species may be found in the keys.

BRITISH COLUMBIA: 1 ♀, Oliver, May 2 1923; 1 ♀, Cranbrook, May 17 1922, (C. B. D. Garrett), [C. N. C.].

WASHINGTON: 1 ♂, Loon Lake, May 16 1924, (A. L. Melander), *Type*, [A. L. M.].

Pegomyia haemorrhoa (Zetterstedt)

Anthomyza haemorrhoa Zetterstedt, Ins. Lapp., p. 692, 1838.

Aricia transversalis Zetterstedt, Dipt. Scand., IV, p. 1538, 1845. Siebke, Enum. Insect. Norveg., p. 112, 1877.

Aricia icterica Holmgren, Öfvers. Kgl. Vet. Akad. Förhandl., (1872), XXIX, nr. 6, p. 102, 1873.

Anthomyia haemorrhoa Neuhaus, Diptera marchica, p. 227, 1886.
Phorbia intersecta Meade, Entom. Month. Mag., II, ser. 4, p. 222, 1893.
Aricia (*Phorbia*) *icterica* Lundbeck, Vidensk. Medd. naturh. Foren. Kbh., II, p. 286, 1900.
Anthomyia (*Pegomyia*) *haemorrhoa* Pandellé, Rev. Ent. France, XX, p. 298, 1901.
Phorbia icterica Aldrich, Misc. Coll. Smithsn. Inst., XLVI, no. 1444, p. 556, 1905.
Pegomyia haemorrhoa Stein, Wien. Ent. Zeitg., XXV, p. 102, 1906. Stein, Arch. f. Naturgesch., (1913), LXXIX, (A), hft. 8, p. 35, 1914. Stein, Arch. f. Naturgesch., (1915), LXXXI, (A), hft. 10, p. 131, 1916. Ringdahl, Trømso Museums Årshefter, XLIX, (1926), nr. 3, p. 33, 1928. Ringdahl, K. Svensk. Vetenskapsakad. Skrift. Naturskydds., nr. 18, pt. III, p. 21, 1931. Tiensuu, Acta Soc. Faun. Flor. Fennica, LVIII, no. 4, p. 28, 1935. Séguy, Gen. Insect., fasc. 205, p. 56, 1937. Carpenter and Holm, Ann. Mag. Nat. Hist., ser. 11, III, p. 71, 1939.
Chortophila icterica Stein, Kat. Paläark. Dipt., III, p. 718, 1907.
Pegomyia (*Pegomyia*) *transversalis* Schnabl and Dziedzicki, Abh. K. Leop.-Carol. Deutsch. Akad. Naturforsch., XCV, nr. 2, p. 112, 1911.
Pegomyia (*Pegomyia*) *haemorrhoa* Séguy, Faune de France, VI, p. 160, 1923. Karl, Tierwelt Deutschlands, XIII, pt. 3, p. 130, 1928. Ringdahl, Ent. Tidskr., LIX, hft. 3–4, p. 200, 1938.
Hylemyia icterica Séguy, Gen. Insect., fasc. 205, p. 96, 1937.

The species *haemorrhoa* is recorded by Carpenter and Holm (1939) as occurring in North East Greenland from specimens identified by Dr. F. W. Edwards. In my opinion the separate sexes of the same species had been previously recorded among the fauna of Greenland by Holmgren (1873) and Lundbeck (1900) under the name *icterica* from specimens taken in North Greenland and on its western littoral. I have seen what I consider to be another specimen of this species from Katmai, Alaska, collected by Professor J. S. Hine.

The series of specimens representing *icterica*, including Lundbeck's cotypes, are deposited in the Zoological Museum of the University of Copenhagen. Through the kindness of Doctor Lundbeck and Doctor Henriksen I have been able to study this material, and it seems evident from what I have seen of these forms that their superficial appearance may vary widely according to the extent and degree of infuscation on thorax, abdomen and legs. There are slight differences observable in the comparative extent to which parafrontals, parafacials and length of prealar bristle may be developed in the males of *icterica* as exemplified in the above series and those of *haemorrhoa* as represented by Swedish

specimens, but I do not believe that such differences are of specific value. All the specimens of *icterica* and *haemorrhoa* that I have seen agree in having the same characteristic form and color to the copulatory appendages. In this respect the species may be linked to *vanduzeei* and the european fly *versicolor* (Meigen). In *vanduzeei* the palpi are yellowish, whereas in the other two species the palpi are largely fuscous.

ALASKA: 1 ♂, Katmai, June 1917, (J. S. Hine).

GREENLAND: 1 ♂, Orpiksūit, July 16 1890; 7 ♂, 1 ♀, Haklahavn, July 30 1892, (W. Lundbeck), [Z. M. U. C.].

Pegomyia rubivora (Coquillett)

Phorbia rubivora Coquillett, Can. Ent., XXIX, p. 162, 1897. Slingerland, Bull. 126, N. Y. (Cornell) Agr. Exp. Station, p. 54–60, 1897. Aldrich, Misc. Coll. Smithsn. Inst., XLVI, no. 1444, p. 557, 1905. Britton, Bull. 31, Conn. Geol. Nat. Hist. Surv., p. 199, 1920. Cole and Lovett, Proc. Cal. Acad. Sci., XI, no. 15, p. 313, 1921.

Chortophila rubivora Stein, Arch. f. Naturgesch., (1917), LXXXIII, (A), hft. 1, p. 154. 1919. Huckett, Ann. Ent. Soc. Amer., XIV, p. 306, 1921. Enderlein, Zeitschr, f. Angew, Entom., XX, hft. 2, p. 328, 1933.

Pegomyia rubivora Malloch, Bull. Brooklyn Ent. Soc., XV, p. 126, 1920. Huckett, Mem. 77, N. Y. (Cornell) Agr. Exp. Station, (1923), p. 47, 1924. Johnson, Occ. Pap. Boston Soc. Nat. Hist., VII, p. 232, 1925. Huckett, Mem. 101, N. Y. (Cornell) Agr. Exp. Station, (1926), p. 841, 1928.

Hylemyia rubivora Séguy, Gen. Insect., fasc. 205, p. 111 and 457, 1937.

The species *rubivora* is closely allied to the european form *dentiens* (Pandellé), from which, with the limited material before me, I am unable to satisfactorily distinguish it, and on account of which I hesitate to draw any further conclusions regarding the possibility of their similar identity. Séguy (1937) after considerable study of the evidence before him finally came to the conclusion that there was not sufficient differences between the two forms to warrant their recognition as separate species. In both forms the male processes are lined on inner margin with an extended series of prominent setae, and parafrontals are wider than distance between posterior ocelli. In habitus both species resemble *glabra* (Stein), from which they may be distinguished by the entirely blackish tibiae and processes.

MANITOBA: 1 ♂, Aweme, May 23 1923, (N. Criddle), [C. N. C.].

NEW YORK: 1 ♂, 1 ♀, Ithaca, April 8 1897, (C. U. Exp. no. 516), *paratypes ex* raspberry canes, [C. U.]. 1 ♀, same locality, May 1 1913; 1 ♀, April 29 1922, (M. D. Leonard). [H. C. H.].

PENNSYLVANIA: 1 ♀, Germantown, April 21 1905, [A. N. S. P.].

QUEBEC: 1 ♂, Quarry Island, Mingan, June 13 1929, (W. J. Brown), [C. N. C.].

Pegomyia glabra (Stein) (Figs. 7, 35, 58.)

Chortophila glabra Stein, Arch. f. Naturgesch., (1918), LXXXIV, (A), hft. 9, p. 88, 1920.

Hylemyia glabra Séguy, Gen. Insect., fasc. 205, p. 95, 1937.

The species is described by Stein as having black legs. An examination of the cotype in the Zoological Museum of the University of Berlin reveals that fore tibiae are largely infuscated, mid and hind tibiae successively less so, the integument being extensively yellowish throughout distal half. In the female the legs are largely reddish yellow. The species resembles *rubivora* in habitus. The processes of male are sparsely bristled and horny in appearance, the inner margin has for the most part a series of fine setulae.

BRITISH COLUMBIA: 1 ♀, Oliver, April 21 1923, (C. B. D. Garrett), [C. N. C.].

CALIFORNIA: 1 ♀, Redwood Canyon, Marin County, May 17 1908, [A. N. S. P.].

COLORADO: 1 ♂, Boulder, April 1 1934, (M. T. James), [Colo. State Col.].

UTAH: 1 ♂, Spanish Fork, (D. Elmo Hardy), [H. C. H.].

WASHINGTON: 1 ♂, Pullman, February 26 1901, *cotype*, [Z. M. U. B.]. 2 ♂, same locality, April 21 1924, (A. L. Melander), [A. L. M.]. 1 ♂, Ellensburg, April 20 1935, (W. W. Baker); 1 ♂, Almota, February 12 1934; 2 ♀, same locality, February 19 1934, (J. F. Clarke), *ex Equisetum* sp., [H. C. H.].

Pegomyia major (Malloch) (Figs. 10, 39, 71.)

Eremomyia major Malloch, Proc. Cal. Acad. Sci., IX, ser. 4, p. 310, 1919. Séguy, Gen. Insect., fasc. 205, p. 122, 1937.

In *major* the second antennal segment is entirely reddish in both sexes, a character which serves to distinguish the species from all related forms known to me.

ALBERTA: 2 ♂, Edmonton, June 6 1937, (E. H. Strickland), [Univ. Alberta].

IDAHO: 1 ♂, Mount Moscow, June 10 1930, (J. M. Aldrich), [U. S. N. M.].

MONTANA: 1 ♀, Gallatin Mts., June 20 1914, 6500 ft. alt., [U. S. N. M.].

OREGON: 1 ♂, 1 ♀, Corvallis, April 17 1929, (V. T. Shattuck); 1 ♀, Kiger's Island, April 12 1930, (J. Wilcox), [H. C. H.].

Pegomyia assimilis Huckett

Pegomyia assimilis Huckett, Trans. Amer. Ent. Soc., LXV, p. 22, 1939.

The species *assimilis* resembles *apicalis* (Stein), from which it may be distinguished by the absence of a bristle on distal half of anteroventral surface of mid femur, and by the presence of setulae at base of posterior notopleural bristle and on the mesopleural declivity dorsad of mesothoracic spiracle.

CALIFORNIA: 1 ♂, San Mateo County, Feb. 22 1920, (E. J. Whitney), *type*, [A. N. S. P.].

Pegomyia thrixia Huckett

Pegomyia thrixia Huckett, Trans. Amer. Ent. Soc., LXV, p. 23, 1939.

The species *thrixia* resembles *incompleta* Stein, from which it may be distinguished by the presence of a few setulae on parafrontals adjacent the ocellar callosity; from *assimilis* by the presence of a bristle on distal half of anteroventral surface of mid femur. In the male of *thrixia* the frons is broad, as in *incompleta*, but it differs from the male of that species in that the vestiture on abdominal sterna 3 and 4 is not restricted to caudal half of each sclerite and the hypopygium is not so enlarged. The female, in my opinion, has been mistakenly recorded by Malloch[32] as *Eremomyia apicalis* Stein.

ALBERTA: 1 ♂, Edmonton, May 15 1937, (E. H. Strickland), [Univ. Alberta].
IOWA: 1 ♂, Ottuma, March 3 1929, (Jaques), *Type*, [A. N. S. P.].
MINNESOTA: 1 ♂, St. Anthomy Park, May 1 1920, [F. M. Snyder].

Pegomyia incompleta (Stein) (Figs. 8, 37, 70.)

Eremomyia incompleta Stein, Berl. Ent. Zeitschr., (1897), XLII, hft. 3–4, p. 228, 1898. Aldrich, Misc. Coll. Smithsn. Inst., XLVI, no. 1444, p. 554, 1905. Stein, Arch. f. Naturgesch., (1917), LXXXIII, (A), hft. 1, p. 153, 1919. Stein, Arch. f. Naturgesch., (1918), LXXXIV, (A), hft. 9, p. 74, 1920. Séguy, Gen. Insect., fasc. 205, p. 122, 1937.

In *incompleta* and *thrixia* the mid femur has a bristle on distal half of anteroventral surface and the frons in male is considerably wider than breadth of third antennal segment. In the male of

[32] Malloch, J. R. Diptera from the Southwestern United States. Paper IV. Anthomyidae. *Trans. Amer. Ent. Soc.*, LXIV. p, 303, 1918.

incompleta the hypopygium is expansive, giving the abdomen a stout truncated appearance, and the bristles on abdominal sterna 3 and 4 are restricted to the caudal half of each sclerite; in the female the second antennal segment is blackish and mid tibia has one or two anteroventral bristles, as in male.

ALBERTA: 1 ♂, Medicine Hat, March 14 1926, (F. S. Carr), [C. N. C.].
IDAHO: 1 ♀, Viola Grade, Moscow, 3000 ft., April 15 1933, (E. W. Whitman).
MINNESOTA: 1 ♂, St. Anthony Park, (Lugger), *cotype*, [Field Museum].
UTAH: 1 ♀, Mount Logan, June 24 1938, (G. F. Knowlton), [Utah Agr. Col.].
WASHINGTON: 3 ♂, Pullman, May 22 1923; 1 ♂, Mount Rainier, Shadow Lake, 6,500 ft. alt., August 15 1932; 2 ♀, August 24 1932, (Dorothy and Charles Martin); 7 ♂, 2 ♀, Mount Rainier, Sunrise, 6400 ft. alt., July 29 1933, (J. Wilcox).

Pegomyia apicalis (Stein) (Figs. 13, 41, 74.)

Eremomyia apicalis Stein, Berl. Ent. Zeitschr., (1897), XLII, p. 227, 1898. Aldrich, Misc. Coll. Smithsn. Inst., XLVI, no. 1444, p. 554, 1905. Malloch, Trans. Amer. Ent. Soc., XLIV, p. 303, 1918. Stein, Arch. f. Naturgesch., (1917), LXXXIII, (A), hft. 1, p. 153, 1919. Stein, Arch. f. Naturgesch., (1918), LXXXIV, (A), hft. 9, p. 74, 1920. Séguy, Gen. Insect., fasc. 205, p. 122, 1937.

Pegomyia apicalis Malloch, Bull. Brooklyn Ent. Soc., XV, p. 125, 1920. Cole and Lovett, Proc. Cal. Acad. Sci., XI, p. 313, 1921.

The species *apicalis* is closely related to *quadrispinosa*, from which it differs by having mid and hind femora in male partly blackened. In the female of *apicalis* the wing veins are brownish and the calyptrae whitish, whereas in *quadrispinosa* the veins are intensively yellowish proximad, and the calyptrae are yellowish tinged.

Stein (1920) in his key to females of *Eremomyia* mentions that the second antennal segment of *apicalis* is distinctly reddish. I have examined the specimens from California on which Stein partly based his diagnosis, and have come to the conclusion that these specimens are not conspecific with the male of *apicalis*, but probably represent the female sex of *major* (Malloch). The second antennal segment of all specimens of *apicalis* before me is at least nearly entirely black, as in *quadrispinosa*. The remaining female specimens listed under *apicalis* by Stein were from Moscow, Idaho. These examples could not be found in the collection at Berlin.

ALBERTA: 1 ♀, Waterton Park, July 14 1923, (E. H. Strickland), [Univ. Alberta].

BRITISH COLUMBIA: 1 ♂, Nicola, May 17 1923, (E. R. Buckell); 1 ♂, Keremeos, June 18 1923, (C. B. D. Garrett), [C. N. C.].

IDAHO: 1 ♂, Lewiston Hill, May 3 1925, (A. L. Melander), [A. L. M.]. 1 ♂, Moscow, *cotype*, [Field Museum].

MONTANA: 1 ♂, Baird, July 31 1923, (A. L. Melander), [A. L. M.].

NEW MEXICO: 1 ♀, Cloudcroft, May 24 1902, [A. N. S. P.].

UTAH: 1 ♂, 2 ♀, Clarkston, April 27 1938, 4 ♂, 3 ♀, Cache Junction, April 27 1938; 1 ♂, Logan Canyon, May 28 1938; 1 ♀, Petersboro, April 27 1938, (G. F. Knowlton), [Utah Agr. Col.].

WASHINGTON: 1 ♂, Blewett, May 29 1932, (J. Wilcox), [H. C. H.]. 1 ♂, Pullman, May 20 1917; 2 ♂, Loon Lake, May 16 1924, (A. L. Melander), [A. L. M.]. 1 ♂, Buckeye, June 21 1930, (J. M. Aldrich), [U. S. N. M.].

WYOMING: 1 ♂, Wilson, July 22 1926, [Univ. Idaho].

Pegomyia fuscicauda Huckett

Pegomyia fuscicauda Huckett, Trans. Amer. Ent. Soc., LXV, p. 31, 1939.

The species *fuscicauda* has the habitus of *chrysida*, of which it might well be considered a darker form. The two species differ notably in the color of antennae and hypopygium. The second antennal segment in *fuscicauda* is extensively infuscated and the reddish tinge on third segment is limited to basal regions or entirely masked, whereas in *chrysida* the second antennal and proximal region of third segment are bright yellow. In the male of *fuscicauda* the hypopygial sclerites are distinctly blackish and lustrous in contrast to the opaque grayish color of abdomen, whereas in *chrysida* these sclerites are grayish pruinescent and tend to conform to the color of the adjoining parts of the abdomen.

In such allied forms as *setiformis* and *frigida* the hypopygium is similarly black and shining, but *fuscicauda* may be distinguished from the former in both sexes by the absence of a robust bristle at apex of posterodorsal surface of fore and hind tibiae, and by the absence of a weak bristle at middle of anteroventral surface of mid tibia; from *frigida* by the absence of a bristle on distal half of anteroventral surface of mid femur. In the female of these three species the third and fourth fore tarsal segments are broadened.

It is evident from the large series of specimens examined that those taken in California are considerably paler than those from Oregon, Washington and Alberta. In the latter form the para-

frontals and mesonotum may be extensively brownish pruinescent and mid and hind femora considerably darkened. In occasional specimens the apical posterodorsal bristle of fore tibia may exhibit some degree of development, and in the female this bristle may become quite robust.

ALBERTA: 1 ♂, Edmonton, June 10 1937, (E. H. Strickland), [Univ. Alberta].

CALIFORNIA: 1 ♂, 1 ♀, Falls, Forest Home, San Bernardino County, November 4 1934, (A. J. Basinger), *type* and *allotype*, [A. N. S. P.]. 1 ♀, Forest Home, November 10 1925, (M. W. Stone); 2 ♂, Mount Home Canyon, San Bernardino Mts., June 8 1924, (J. M. Aldrich), [U. S. N. M.]. 1 ♂, Mount Wilson, August 4 1915; 1 ♀, Fallen Leaf, 6500 ft. alt., July 16 1917, (J. M. Aldrich), [U. S. N. M.]. 1 ♀, Gold Lake Camp, Plumas County, July 20 1916; 1 ♀, Giant Forest, Sequoia National Park, August 22 1917, (R. C. Shannon), [H. C. H.].

COLORADO: 2 ♀, Lake City, 8700 ft. alt., August 8–15 1936, (C. L. Fluke), [Univ. Wisc.].

IDAHO: 1 ♂, Waha, May 30 1924, (A. L. Melander), [A. L. M.].

OREGON: 1 ♀, Hood River, (Childs); 1 ♀, Three Sisters, Scott Lake, 4650 ft. alt., August 8 1926, (H. A. Scullen), [Ore. State Col.].

WASHINGTON: 2 ♂, 1 ♀, Electron, May 7 1925, (A. L. Melander), *paratypes*, [A. L. M.]. 1 ♂, Mount Rainier, White River, July 20 1924; 1 ♀, Mount Baker, Skyline Trail, August 10 1925, (A. L. Melander), [A. L. M.]. 1 ♀, Longmire Spring, August 29 1925; 2 ♀, Mount Rainier, Yakima Park, July 25 1932; 1 ♂, 1 ♀, Mount Rainier, Shadow Lake, July 31 1932, 6200 ft. alt.; 1 ♀, Mount Rainier, White River Camp, August 10 1934, (J. Wilcox), [J. Wilcox].

Pegomyia spinigerella Malloch (Figs. 18, 47, 81.)

Pegomyia spinigerella Malloch, Trans. Amer. Ent. Soc., XLVI, p. 178, 1920. Malloch, Bull. Brooklyn Ent. Soc., XV, p. 124, 1920. Frison, Bull. Ill. Nat. Hist. Surv., XVI, p. 206, 1927.

Pegonomyia spinigerella Séguy, Gen. Insect., fasc. 205, p. 320, 1937.

In the male of *spinigerella* all the femora are largely fuscous or brownish, being darker than tibiae; in the female the femoral infuscation is not so noticeable. In both sexes the scutellum is faintly yellowish apicad and bare on disc, the mesonotum has a brownish spot caudad of each bristle belonging to last pair of dorsocentrals. In the female the tarsi become increasingly slender and thin distad, the third and fourth segments being laterally compressed. The species is further discussed in the paragraphs dealing with *spinosissima* Stein.

ARIZONA: 1 ♀, Pinery Canyon, Foothills, Chirichua Mts., 5200 ft. alt., July 2, (Witmer Stone), [A. N. S. P.].

FLORIDA: 1 ♂, Jacksonville, Nov. 3 1911, [U. S. N. M.].

ILLINOIS: 1 ♂, Havana, April 30 1914, *type*, [Ill. N. H. S.]. 1 ♂, Havana, June 3 1918, *paratype*, [A. N. S. P.].

SOUTH DAKOTA: 1 ♂, Canton, June 17 1924, [H. C. H.].

TEXAS: 1 ♂, College Station, March 20 1929, (H. J. Reinhard); 1 ♀, same locality, May 3 1931; 1 ♂, April 1 1930, (F. M. Hull), [Texas A. & M. Col.].

Pegomyia affinis Stein

Pegomyia affinis Stein, Berl. Ent. Zeitschr., (1897), XLII, p. 286, 1898. Coquillett, Invert. Pacific, Dipt., I, p. 33, 1904. Aldrich, Misc. Coll. Smithsn. Onst., XLVI, no. 1444, p. 558, 1905. Malloch, Trans. Amer. Ent. Soc., XLIV, p. 302, 1918. Stein, Arch. f. Naturgesch., (1917), LXXXIII, (A), hft. 1, p. 148, 1919. Stein, Arch. f. Naturgesch., (1918), LXXXIV, (A), hft. 9, p. 72, 1920. Malloch, Bull. Brooklyn Ent. Soc., XV, p. 124, 1920. Huckett, Ann. Ent. Soc. Amer., XIV, p. 312, 1921. Cole and Lovett, Proc. Cal. Acad. Sci., XI, p. 313, 1921. Huckett, Mem. 77, N. Y. (Cornell) Agr. Exp. Station, (1923), p. 43, 1924. Johnson, Occ. Pap. Boston Soc. Nat. Hist., VII, p. 232, 1925. Johnson, Insect Fauna, Biol. Surv. Mt. Desert Region, p. 209, 1927. Huckett, Mem. 101, N. Y. (Cornell) Agr. Exp. Station, (1926), p. 840, 1928. Curran, Bull. Amer. Mus. Nat. Hist., LXI, p. 86, 1930. Séguy, Gen. Insect., fasc. 205, p. 51, 1937.

Pegomyia vicina Stein (not Lintner), Berl. Ent. Zeitschr., (1897), XLII, p. 239, 1898.

The species *affinis* may be distinguished from related forms by the following characters: Third antennal segment entirely black, scutellum blackish along lateral declivities and with a yellowish ventrocentral streak, hairs absent on pteropleura above caudal pair of sternopleural bristles, apical posterodorsal bristle on fore and hind tibiae invariably weakly developed. In occasional specimens palpi may be infuscated at apex. Frost[33] in error has applied the name *affinis* for a leaf-miner in dock, a species which Malloch (1919) later described as *vanduzeei*.

CALIFORNIA: 1 ♀, San Diego, March 28 1916, (H. G. Dyar), [U. S. N. M.]. 1 ♂, Corona, March 23 1932; 1 ♀, Colton, March 5 1932, (C. H. Martin). 1 ♀, Lane's "Rdwd." Camp, June 22; 1 ♂, Mill Creek Canyon, San Bernardino Mts., June 7 1924, (J. M. Aldrich), [U. S. N. M.]. 1 ♀, Forest Home, San Bernardino County, Sept. 21 1935; 1 ♀, Chino, April 25 1934; 1 ♀, Loma Linda, March 20 1933, (A. J. Basinger). 1 ♀, Aguanga, April 23 1933, [A. J. Basinger].

[33] Frost, S. W. Two species of Pegomyia mining the leaves of dock. *Journ. Agr. Research*, XVI, pp. 229–243, 3 pls., 1919.

ILLINOIS: 2 ♂, 1 ♀, Algonquin, [U. S. N. M.].

MARYLAND: 5 ♂, 6 ♀, Plummers Island, June 15 1911, from den of *Marmota*, (H. S. Barber), [U. S. N. M.].

MASSACHUSETTS: 1 ♂, Beverly, June 13 1870, [U. S. N. M.]. 1 ♀, Petersham, June 9 1932, (A. L. Melander), [A. L. M.].

NEW HAMPSHIRE: 1 ♀, Franconia, (Slosson), [A. M. N. H.].

NEW MEXICO: 1 ♀, Deer Creek Canyon, Peloncillo Mts., [U. S. N. M.].

NEW YORK: 1 ♂, Onteora Mountain, Greene County, July 4 1929, (L. O. Howard), [U. S. N. M.]. 2 ♂, 2 ♀, Taughanic Falls, near Ithaca, August 14 1928; 1 ♀, Aurora, May 30 1920; 1 ♂, Ithaca, May 23; 1 ♂, Lake Ridge, near Ithaca, June 20 1920; 2 ♂, Coy Glen, near Ithaca, May 22 1922; 1 ♂, Harmon, July 5 1926; 1 ♂, Riverhead, Long Island, May 8 1927, [H. C. H.]. 1 ♂, Babylon, Long Island, May 12 1935, (F. S. Blanton). 1 ♀, Poundridge, May 16 1931, (A. L. Melander), [A. L. M.].

OKLAHOMA: 1 ♀, Wyandotte, June 4 1934, (M. Maxwell), [Okla. A. & M. Col.].

ONTARIO: 2 ♂, Ottawa, July 10 1919, (G. E. Shewell), [C. N. C.]. 1 ♂, Waubamick, June 1915, (H. S. Parish), [A. L. M.].

OREGON: 2 ♂, Roseburg, April 6 1930, (J. Wilcox). 1 ♀, Talent, September 30 1916, (C. A. McCormick), [J. Wilcox].

QUEBEC: 1 ♀, Hemmingford, July 3 1924, (T. Armstrong). 1 ♀, St. Anne's, August 3 1918, [Macdonald College]. 1 ♀, Abbotsford, June 11 1936, (G. E. Shewell), [C. N. C.].

RHODE ISLAND: 1 ♂, Watch Hill, September 6 1920, (W. J. Holland), [Carnegie Museum].

UTAH: 1 ♀, Centerville, June 11 1935, (G. F. Knowlton), [Utah Agr. Col.]. 1 ♀, Logan, July 20 1938, (D. E. Hardy).

VERMONT: 1 ♀, Bolton, July 16 1935, (F. S. Blanton), [H. C. H.].

VIRGINIA: 1 ♂, Acquia Creek, May 24 1896, *cotype*, [Field Museum]. 1 ♂, Chain Bridge, September 18 1921, (J. R. Malloch), [U. S. N. M.]. 1 ♀, Great Falls, June 21 1931, (A. L. Melander), [A. L. M.].

WASHINGTON: 1 ♂, Kiona, March 1 1935, (J. Wilcox), [H. C. H.].

WISCONSIN: 1 ♂, Dane County, June 23 1936, (F. M. Snyder); 1 ♂, Racine, May 30, 1932, (T. C. Allen), [Univ. Wisc.].

Pegomyia acutipennis Malloch (Figs. 9, 38, 59.)

Pegomyia acutipennis Malloch, Trans. Amer. Ent. Soc., XLIV, p. 301, 1918. Malloch, Bull. Brooklyn Ent. Soc., XV, p. 125, 1920. Huckett, Mem. 77, N. Y. (Cornell) Agr. Exp. Station, (1923), p. 43, 1924. Frison, Bull. Ill. Nat. Hist. Surv., XVI, p. 205, 1927. Huckett, Mem. 101, N. Y. (Cornell) Agr. Exp. Station, (1926), p. 840, 1928. Séguy, Gen. Insect., fasc. 205, p. 51, 1937.

I have considered the species *acutipennis* and others with yellowish tibiae as allied to the dark-legged forms of the *dissecta*-group

because the species possess the following characters in common: Apical setulae of scutellum hairlike, cruciate bristles present in both sexes, palpi flattish and broadened, and in the male the processes are typical of *dissecta*. In *acutipennis* the palpi are blackish and not yellowish as in certain allied species, the abdomen in male is slender and is marked on the terga with a series of trimaculate areas, resembling *Anthomyia pluvialis* L. in this respect.

ALBERTA: 1 ♀, Banff, September 21 1922, (C. B. D. Garrett), [C. N. C.].

ARIZONA: 1 ♀, Carr Canyon, Huachuca Mts., Cochise County, August 1905, *paratype*, [A. N. S. P.].

BRITISH COLUMBIA: 1 ♀, Keremeos, July 10 1923; 1 ♀, June 27 1923, [C. N. C.].

CALIFORNIA: 2 ♂, 17 ♀, Cuyamaca Mts., San Diego County, Aug. 16 1914, (J. C. Bradley), [C. U.]. 1 ♀, Mill Creek, San Bernardino Mts., 5200–5500 ft. alt., August 28, (Rehn & Hebard), [A. N. S. P.]. 1 ♀, Gold Lake Camp, Plumas County, July 20 1916; 1 ♀, Mount Home Canyon, San Bernardino Mts., June 8 1924, (J. M. Aldrich), [U. S. N. M.].

COLORADO: 1 ♀, Lake City, August 8–21, 1938, alt. 9000 ft., (C. L. Fluke), [Univ. Wisc.].

ILLINOIS: 1 ♀, Grand Tower, April 21 1914, [Ill. N. H. S.].

NEW MEXICO: 1 ♂, Alamogordo, April 30 1902, *type*, [A. N. S. P.].

NEW YORK: 1 ♂, Black Mountain, Lake George, Sept. 4 1920, (M. D. Leonard), [H. C. H.].

TEXAS: 1 ♀, Chisos Mountains, July 11, (H. W. Wenzel), [A. N. S. P.].

WISCONSIN: 1 ♀. Devils Lake, May 30 1936, (F. M. Snyder), [Univ. Wisconsin].

Pegomyia anabnormis Huckett

Pegomyia anabnormis Huckett, Trans. Amer. Ent. Soc., LXV, p. 20, 1939.

I have tentatively accorded specific rank to the closely allied forms *anabnormis*, *abnormis* and *rectifrons*. It is quite possible that on further study of more material it will be found that one or more of these forms are but variants of the same species. In the male of *anabnormis* the eyes are closely approximate on frons, and the humeral callosities and scutellum are grayish black, concolorous with mesonotum. The male from South Dakota differs from the type of *anabnormis* in having second antennal segment extensively infuscated and not entirely yellowish; the male from New Mexico has mid and hind femora largely yellowish. All three species are allied to *acutipennis*, from which they may be distinguished by their yellowish palpi.

British Columbia: 1 ♂, Keremeos, July 31 1923, (C. B. D. Garrett), *type*, [C. N. C.].

California: 1 ♀, Falls, Forest Home, San Bernardino County, September 4 1934, (A. J. Basinger), *allotype*, [C. N. C.].

New Mexico: 1 ♂, Santa Fé, July, [A. N. S. P.].

South Dakota: 1 ♂, Spearfish, July 28 1924, [H. C. H.].

Pegomyia lunatifrons (Zetterstedt)

Anthomyza lunatifrons Zetterstedt, Dipt. Scand., IV, p. 1708, 1845.

Pegomyia minima Stein, Wien. Ent. Zeitg., XXV, p. 100, 1906. Stein, Arch. f. Naturgesch., (1913), LXXIX, (A), hft. 8, p. 34, 1914. Stein, Arch. f. Naturgesch., (1915), LXXXI, (A), hft. 10, p. 126, 1916. Karl, Tierwelt Deutschlands, XIII, pt. 3, p. 137, 1928. Ringdahl, Arkiv Zool., XXI (A), no. 20, p. 5, 1930. Ringdahl, K. Svensk. Veten. Kap. Akad. Skrift. Naturskyddsärenden, nr. 18, p. 21, 1931. Séguy, Gen. Insect., fasc. 205, p. 60, 1937.

Pegomyia lunatifrons Stein, Kat. Paläark. Dipt., III, p. 705, 1907.

Pegomyia (*Pegomyiella*) *lunatifrons* Ringdahl, Ent. Tidskr., LIX, hft. 3–4, p. 212, 1938.

The specimens were identified by Mr. Ringdahl as those of *minima* Stein. I have accepted his later conclusions (1938) to the effect that *minima* is a synonym of *lunatifrons* (Zetterstedt). The species, as Ringdahl has indicated, is notable on account of the abnormally robust development of costa. In North American specimens the abdomen is slender and frail, terga clothed with uniformly slender erect bristles that exhibit little if any differentiation into marginal and discal bristles, cephalic third of third, fourth and fifth terga and a considerable median area on first & second terga are devoid of bristles, processes are yellowish, lamellate and rounded on apical margin, with a dense fringe of fine short setulae on inner margin, the setulae becoming sparser distad, inner margin has a glossy chitinous process at apex, ventral sternopleural bristle of caudal pair shorter than anterior sternopleural bristle, antennae and palpi black, proboscis polished, tarsal segments robust and compressed, third and fourth being short.

The female agrees with the male in many of the above characters, differing in that abdominal bristles are shorter and marginal bristles of terga are developed into a series of stouter bristles, anal palpi of ovipositor have fine slender setulae, head has cruciate bristles

and a longish pair of caudal ocellar bristles, the latter are directed outward.

ALBERTA: 1 ♀, Banff, September 7 1922, (C. B. D. Garrett), [C. N. C.].
OREGON: 2 ♂, 1 ♀, Aneroid Lake, Blue Mts., 7500 ft. alt., July 23 1929, (H. A. Scullen), [H. C. H.].

Pegomyia corrupta Huckett

Pegomyia corrupta Huckett, Trans. Amer. Ent. Soc., LXV, p. 13, 1939.

The species *corrupta* has the habitus of *albimargo* (Pandellé), under which name it was first recorded by Malloch[34] as occurring in North America. I have reexamined the specimens which formed the basis for this record and believe them to be distinct from *albimargo* on account of the absence of mesonotal stripings and scutellar marks that characterize the *albimargo*-subgroup. The male specimens of *corrupta* that I have seen exhibit a certain degree of variability in abdominal and femoral coloration. In one of the paratypes the abdomen is partly yellowish and the hind femora are yellowish proximad, whereas in the remaining specimens the femora are entirely blackish, resembling those of *flavifrons* (Walker). The processes of *corrupta* also resemble those of *flavifrons* in structure and bristling, but they are not so widely separated from one another as in that species. I have seen another specimen of *corrupta* taken by J. S. Hine at Naknek Lake, Savonoski, Alaska.

ALASKA: 1 ♂, Nome, August 24–25, 1916, (F. Johansen), *type*, [C. N. C.]. 2 ♂, same locality, Aug. 21 1916, (F. Johansen), *paratypes*, [C. N. C.].

Pegomyia longicornis Huckett

Pegomyia longicornis Huckett, Trans. Amer. Ent. Soc., LXV, p. 14, 1939.

The species *longicornis* is largely blackish in color except for the tibiae, which are yellowish or rufous. Structurally the species may be distinguished from other forms by the conspicuously large third antennal segment, by the slender dimensions of parafrontals, parafacials and cheeks, and by the wide space between the series of

[34] Malloch, J. R. The Diptera collected by the Canadian Expedition, 1913–18 (excluding the Tipulidae and Culicidae). *Rep. Can. Arctic Exped.*, (1913–18), III, Ins., pt. C., pp. 74C–75C, 1919.

presutural acrostical bristles. In the male the processes are abruptly but inconspicuously compressed on outer border (dorsad) to form a bare polished area that extends to apex, inner border clothed with an inner series of dense fine hairs and an outer series of longish setulae. In the female there is a considerable degree of variation in extent of femoral infuscation and in development of cruciate bristles; the caudal pair of ocellar bristles is short and directed forward.

ALBERTA: 1 ♀, Edmonton, May 31 1937, (E. H. Strickland), [Univ. Alberta].
BRITISH COLUMBIA: 1 ♂, Keremeos, June 23 1923; 1 ♀, same locality, June 17 1923, (C. B. D. Garrett), *type* and *allotype*, [C. N. C.]. 1 ♂, 2 ♀, Lillooet, June 21 1917, (J. D. Tothill), [C. N. C.].

Pegomyia flavifrons (Walker) (Figs. 20, 83, 87.)

Eriphia flavifrons Walker, List Dipt. Brit. Mus., IV, p. 966, 1849. Osten Sacken, Misc. Coll. Smithsn. Inst., no. 270, p. 167, 1878. Aldrich, Misc. Coll. Smithsn. Inst., XLVI, no. 1444, p. 536, 1905.

Pegomyia flavifrons Stein, Zeitschr. f. Hymn. Dipt., II, hft. 4, p. 196, 1901. Stein, Arch. f. Naturgesch., (1917), LXXXIII, (A), hft. 1, p. 148, 1919. Huckett, Canad. Ent., LXVI, p. 136, 1934. Séguy, Gen. Insect., fasc. 205, p. 54, 1937.

Pegomyia fringilla Malloch, Trans. Amer. Ent. Soc., XLVI, p. 181, 1920. Malloch, Bull. Brooklyn Ent. Soc., XV, p. 126, 1920. Huckett, Mem. 77, N. Y. (Cornell) Agr. Exp. Station, (1923), p. 44, 1924. Frison, Bull. Ill. Nat. Hist. Surv., XVI, p. 205, 1927. Huckett, Mem. 101, N. Y. (Cornell) Agr. Exp. Station, (1926), p. 840, 1928.

Pogonomyia fringilla Séguy, Gen. Insect., fasc. 205, p. 319, 1937.

There is little doubt in my mind regarding the validity of the above synonymy after seeing the female type of *flavifrons* in the British Museum of Natural History. The species structurally is very similar to the european form *albimargo* (Pandellé), which might be regarded justifiably as a variant of *flavifrons*. Both species are characteristic of a small segregate within the *hyoscyami*-group that may be superficially recognized by the peculiar position of the striping on mesonotum and by the occurence of a dark marking across basal region of scutellum when viewed from behind. On the mesonotum appear four postsutural interserial stripes, an inner pair between the respective series of acrostical and dorsocentral bristles and an outer more deeply marked pair between the respective series of dorsocentral and intraalar bristles.

The species *flavifrons* does not readily conform to the characters defining the *hyoscyami*-group owing to the more restricted dimensions of the head parts. However the cheeks are well maintained caudad and the ventral region of occiput is slightly swollen, as in that group. In the male of *flavifrons* the femora are nearly entirely blackened and frequently the tibiae are more or less infuscated. In the female the thoracic markings are not so apparent as in male, the frons at base of antennae, parafacials and cheeks are largely reddish, the face grayish black, cruciate bristles absent, abdomen grayish drab, fifth abdominal tergum with a few erect discal setae, ovipositor short and weakly chitinized, densely setulose on ventral surface, the femora may be largely or entirely blackish.

ALBERTA: 1 ♂, Wabamun, July 22 1936, (E. H. Strickland), [Univ. Alberta].

IDAHO: 1 ♂, L. Waha, July 22 1927, (J. M. Aldrich), [U. S. N. M.].

MICHIGAN: 1 ♂, Detroit, May 24 1935, (Geo. Steyskal), [G. Steyskal].

NEW YORK: 1 ♂, Ithaca, June 27 1913; 1 ♀, Huntingdon, Long Island, August 5 1934, (Blanton & Borders). 1 ♀, Poughkeepsie, July 14 1926; 1 ♀, Honeoye Falls, May 19 1916, (M. D. Leonard), [H. C. H.].

OHIO: 1 ♀, Columbus, April 28 1902, (J. S. Hine), [U. S. N. M.].

OREGON: 1 ♂, 1 ♀, Astoria, April 10 1937, (A. W. Larson), [Ore. State Col.].

PENNSYLVANIA: 1 ♂, 1 ♀, Swarthmore, May 5 1907, *type* and *allotype* of *P. fringilla* Malloch, [A. N. S. P.].

QUEBEC: 1 ♀, Mutton Bay, July 11 1929, (W. J. Brown), [C. N. C.].

SOUTH DAKOTA: 1 ♀, Brookings, June 7 1925, (H. C. Severin), [South Dakota State Col.].

WISCONSIN: 1 ♀, Madison, May 17 1919, (J. E. Dudley); 1 ♂, Jefferson County, May 17 1937; 1 ♂, Dane County, April 28 1937; 1 ♀, Pine Bluff, May 10 1935, (F. M. Snyder), [Univ. Wisc.].

Pegomyia aninotata Huckett

Pegomyia aninotata Huckett, Trans. Amer. Ent. Soc., LXV, p. 15, 1939.

The male of *aninotata* runs in the key to near *longicornis* and *flavifrons*, with which it agrees in having thorax, abdomen and all femora entirely blackish. It may be separated from *flavifrons* by the absence of interserial markings on mesonotum, and from *longicornis* by the broader subtriangular markings of abdomen and less widely separated series of presutural acrostical bristles.

ALBERTA: 1 ♂, Banff, May 29 1917, *type*, [C. N. C.].

Pegomyia cognata Stein (Figs. 21, 82, 89.)

Pegomyia cognata Stein, Arch. f. Naturgesch., (1918), LXXXIV, (A), hft. 9, p. 67, 1920. Séguy, Gen. Insect., fasc. 205, p. 54, 1937.

The species *cognata* belongs to the *hyoscyami*-subgroup, as indicated by the structure of the head. The frons and face are semibuccate, cheeks strong and lower region of occiput swollen or puffy. In comparison with related species, *cognata* has a proboscis of more slender proportions, prealar bristle absent, third and fourth abdominal terga with a transverse series of discal bristles, facial margin and vibrissal angle contrastingly reddish yellow, cephalic margin of vibrissal angle relatively heavily chitinized and polished, *r–m* cross veins faintly infuscated.

In the male the processes are sharply attenuated on distal half, fore and mid tibiae have no mid anterodorsal bristle, second antennal segment may be entirely yellowish or largely infuscated, mid and hind femora may show a high degree of variability in extent and intensity of infuscation, halteres at least partly tinged with purple.

CALIFORNIA: 5 ♂, Samoa Beach and dunes, Humboldt County, June 18 1907, (J. C. Bradley), [C. U.]; 3 ♂, Stanford University, February 28 1906, *cotypes*, [Z. M. U. B.].

Pegomyia ruficeps Stein (Figs. 22, 84, 88.)

Pegomyia ruficeps Stein, Berl. Ent. Zeitschr., (1897), XLII, p. 286, 1898. Coquillett, Invert. Pacif., Dipt., I, p. 33, 1904. Aldrich, Misc. Coll. Smithsn. Inst., XLVI, no. 1444, p. 558, 1905. Stein, Arch. f. Naturgesch., (1917), LXXXIII, (A), hft. 1, p. 148, 1919. Stein, Arch. f. Naturgesch., (1918), LXXXIV, (A), hft. 9, p. 72, 1920. Malloch, Bull. Brooklyn Ent. Soc., XV, p. 124, 1920. Huckett, Mem. 77, N. Y. (Cornell) Agr. Exp. Station, (1923), p. 47, 1924. Frost, Mem. 78, N. Y. (Cornell) Agr. Exp. Station, (1923), p. 125, 1924. Huckett, Mem. 101, N. Y. (Cornell) Agr. Exp. Station, (1926), p. 841, 1928. Séguy, Gen. Insect., fasc. 205, p. 61, 1937.

This small species may be distinguished from its closest relatives by the scalelike sharply defined yellowish area at base of inner surface of third antennal segment. The mid and hind femora are invariably yellowish, but in order to make the widest allowance in

the use of such a character for diagnostic purposes I have included this and other related species under both captions in male key relating to differences in femoral coloration.

DISTRICT OF COLUMBIA: 1 ♂, Washington, August 5, (J. M. Aldrich), [U. S. N. M.].

FLORIDA: 2 ♂, 1 ♀, Miami, March 19 1909, [U. S. N. M.].

LOUISIANA: 1 ♂, Opelousas, April 1897, *cotype*, [Field Museum].

MICHIGAN: 1 ♂, East Lansing, June 1 1937, (C. W. Sabrosky), [Mich. State Col.].

MINNESOTA: 1 ♀, Rochester, June 5 1922, (H. G. Dyar), [U. S. N. M.].

NEW YORK: 3 ♂, 2 ♀, Riverhead, Long Island, August 10 1922; 4 ♂, 3 ♀, same locality, July 4 1935, *ex Amaranthus retroflexus;* 1 ♀, Ithaca, August 3 1920, 1 ♀, Poughkeepsie, July 14 1927, [H. C. H.].

ONTARIO: 1 ♂, Burlington, 1919, [H. C. H.].

OREGON: 1 ♂, Hood River, (Childs), [J. Wilcox].

QUEBEC: 2 ♂, 1 ♀, Saint Anne's, August 6 1918, [Macdonald Col.].

TEXAS: 1 ♂, Brownsville, April 1 1909, *Amaranthus retroflexus;* 1 ♀, Denison, June 24, (H. S. Barber), [U. S. N. M.].

WISCONSIN: 1 ♂, Fountain City, Buffalo County, August 12–17, 1910; 1 ♂, Dane County, July 7 1937, (F. M. Snyder), [Univ. Wisc.].

Pegomyia rufescens Stein

Pegomyia rufescens Stein, Berl. Ent. Zeitschr., (1897), XLII, p. 238, 1898. Aldrich, Misc. Coll. Smithsn. Inst., XLVI, no. 1444, p. 558, 1905. Stein, Arch. f. Naturgesch., (1917), LXXXIII, (A), hft. 1, p. 148, 1919. Stein, Arch. f. Naturgesch., (1918), LXXXIV, (A), hft. 9, p. 65, 1920. Malloch, Bull. Brooklyn Ent. Soc., XV, p. 124, 1920. Séguy, Gen. Insect., fasc. 205, p. 61, 1937.

The species resembles *ruficeps*, differing in that yellowish area at base of third antennal segment is diffuse and not sharply defined. In the female the ventral sternopleural bristle of caudal pair is well developed and not weak or absent as in *ruficeps*.

ILLINOIS: 1 ♂, Freeport, July 2 1917; 1 ♀, Dubois, August 9, 1917; 1 ♀, Algonquin, no date, [Ill. N. H. S.].

ONTARIO: 1 ♂, London, 1896, *cotype*, [Field Museum].

WISCONSIN: 1 ♀, Dane County, August 28 1935, (Fred Snyder), [Univ. Wisc.].

Pegomyia minuta Malloch

Pegomyia minuta Malloch, Trans. Amer. Ent. Soc., XLIV, p. 302, 1918. Malloch, Bull. Brooklyn, Ent. Soc., XV, p. 123, 1920. Séguy Gen. Insect., fasc. 205, p. 60, 1937.

The head of *minuta* structurally resembles that of *ruficeps*, from which it differs by having the third antennal segment entirely blackish. In *minuta* the tarsal segments are entirely yellow, prealar bristle absent, and unlike the male of *cognata* the mid tibia has a mid anterodorsal bristle.

CALIFORNIA: 1 ♂, Vinton, July 18 1916, (H. G. Dyar), [U. S. N. M.].
NEW MEXICO: 1 ♂, Alamogordo, April 14 1902, *type*, [A. N. S. P.].
UTAH: 1 ♀, Kelton, June 9 1930, (G. F. Knowlton), [Utah Agr. Col.].

Pegomyia vanduzeei Malloch

Pegomyia vanduzeei Malloch, Proc. Cal. Acad. Sci., IX, ser. 4, p. 307, 1919. Malloch, Bull. Brooklyn Ent. Soc., XV, p. 126, 1920. Huckett, Mem. 77, N. Y. (Cornell) Agr. Exp. Station, (1923), p. 47, 1924. Frost, Mem. 78, N. Y. (Cornell) Agr. Exp. Station, (1923), p. 125, 1924. Huckett, Mem. 101, N. Y. (Cornell) Agr. Exp. Station, (1926), p. 841, 1928. Séguy, Gen. Insect., fasc. 205, p. 65, 1937.
Pegomyia affinis Frost not Stein, Journ. Agr. Research, XVI, p. 240, 1919.

The species *vanduzeei* and others of the same group tend to exhibit wide degrees of variation in color of abdomen, legs and antennae. Their recognition and relationship may be readily confirmed by an examination of the structure and armature of proccesses of fifth abdominal sternum in male, of which those in *vanduzeei* are typical. The palpi in *vanduzeei* are invariably reddish or yellowish, whereas in *haemorrhoa* and the european form *versicolor* (Meigen) they are fuscous.

BRITISH COLUMBIA: 1 ♀, Vernon, August 14 1923, (D. G. Gillespie), [C. N. C.].
MANITOBA: 1 ♂, 2 ♀, Morden, May 31 1925, (R. M. White), [C. N. C.].
MONTANA: 1 ♀, Pipestone Pass, July 29 1923, (A. L. Melander), [A. L. M.].
NEW YORK: 2 ♂, Ithaca, May 5 1915; 1 ♀, May 8 1914, [H. C. H.].

Pegomyia convergens Huckett

Pegomyia convergens Huckett, Trans. Amer. Ent. Soc., LXV, p. 5, 1939.

The species *convergens* has the habitus of *ruficeps*, from which it differs in having palpi broadly fuscous distad and third antennal segment entirely black. In the male the processes bear a thickened polished strip on distal region of inner margin. In the female cruciate bristles are present.

KANSAS: 1 ♀, Sand dunes, Madora County, April 28 1934, (C. W. Sabrosky), [H. C. H.].

SASKATCHEWAN: 1 ♂, 1 ♀, Northeast Walker, May 20 1923, *type* and *allotype*, [C. N. C.].

Pegomyia striata Stein

Pegomyia striata Stein, Arch. f. Naturgesch., (1918), LXXXIV, (A), hft. 9, p. 71, 1920. Séguy, Gen. Insect., fasc. 205, p. 64, 1937.

The species *striata* is only known to me through the type, a male from Opelousas, Louisiana, deposited in the Zoological Museum of the University of Berlin. Its affinities are not to be readily detected. I have placed the species tentatively in the *hyoscyami*-subgroup largely on account of similarities in the character of the head. All the femora are brownish tinged in the type specimen, being darker than tibiae, mid tibia has two fine short anterodorsal bristles and two posterodorsal bristles situated on distal half, hind tibia with two anteroventral bristles, abdomen depressed and sides parallel, with a series of fuscous subtriangular marks on terga, processes pendant and broad throughout, with only a few sparse setulae, parafacials and cheeks are grayish drab and broadly developed, second antennal segment reddish brown, palpi entirely fuscous.

LOUISIANA: 1 ♂, Opelousas, March 1897, *cotype*, [Z. M. U. B.].

Pegomyia jacobi Malloch

Pegomyia jacobi Malloch, Ohio Journ. Science, XX, p. 272, 1920. Malloch, Bull. Brooklyn Ent. Soc., XV, p. 126, 1920. Séguy, Gen. Insect., fasc. 205, p. 59, 1937.

I know the species only from the type specimen, a male taken in Alaska by J. S. Hine, which is deposited in the collections of Ohio State University. The species belongs to the *bicolor*-subgroup, having the same type of processes as in the male of *bicolor* and also possessing a robust apical posterodorsal bristle on hind tibia as in that species. However in *jacobi* the antennae, palpi and abdomen are entirely and all femora largely blackish, mid tibia has a weak bristle on anterior surface, and the series of parafrontal bristles extend caudad to vertex of head.

ALASKA: 1 ♂, Katmai, July 1917, (J. S. Hine), *type*, [Ohio State Univ.].

Pegomyia indicta Huckett

Pegomyia indicta Huckett, Trans. Amer. Ent. Soc., LXV, p. 3, 1939.

The species *indicta* has the habitus of *hyoscyami* and allied forms, from many of which it may be readily separated in the male by the broadly truncated processes, narrower frons, and absence of a bristle at middle of anterodorsal surface of mid tibia. In these respects the male agrees with that of *carduorum*, from which it may be distinguished by the darker color of abdomen, femora and second antennal segment.

ALASKA: 1 ♂, Katmai, June 10 1919, (J. S. Hine), *type* [Ohio State Univ.].

Pegomyia atlanis Huckett

Pegomyia atlanis Huckett, Trans. Amer. Ent. Soc., LXV, p. 4, 1939.

The species *atlanis* belongs to the *hyoscyami*-subgroup as denoted by the broadly developed head sclerites. The processes in male are structurally similar to those of *ruficeps* and *convergens*. The species has all femora largely infuscated, second antennal segment extensively blackish, palpi entirely blackish, thorax and abdomen with well marked dorsocentral vitta, and distal section of proboscis notably short and fleshy.

NEW YORK: 1 ♂, 1 ♀, Orient, Long Island, June 6 1936, *type* and *allotype*, [A. N. S. P.]. 1 ♀, Babylon, Long Island, June 9 1936; 1 ♀, June 15 1936, [H. C. H.].

Pegomyia juvenilis (Stein)

Hylemyia juvenilis Stein, Berl. Ent. Zeitschr., (1897), XLII, p. 211, 1898. Howard, Proc. Wash. Acad. Sci., II, p. 584, 1900. Aldrich, Misc. Coll. Smithsn. Inst., XLVI, no. 1444, p. 552, 1905. Huckett, Ann. Ent. Soc. Amer., XIV, p. 308, 1921. Séguy, Gen. Insect., fasc. 205, p. 98, 1937.

Pegomyia juvenilis Stein, Arch. f. Naturgesch., (1917), LXXXIII, (A), hft. 1, p. 148, 1919. Malloch, Bull. Brooklyn Ent. Soc., XV, p. 124, 1920. Stein, Arch. f. Naturgesch., (1918), LXXXIV, (A), hft. 9, p. 72, 1920. Huckett, Mem. 77, N. Y. (Cornell) Agr. Exp. Station, (1923), p. 45, 1924. Johnson, Occ. Pap. Boston Soc. Nat. Hist., VII, p. 232, 1925. Johnson, Insect Fauna, Biol. Surv. Mt. Desert Region, p. 210, 1927. Huckett, Mem. 101, N. Y. (Cornell) Agr. Exp. Station, (1926), p. 840, 1928.

The species *juvenilis* is closely related to *palposa* (Stein) and the european form *virginia* (Meigen), from both of which it may be readily distinguished by the yellow legs. All three species are

characterized by having arista plumose, apical setulae of scutellum hairlike, processes of fifth abdominal sternum in male armed with a matt of dense setulae, cruciate bristles present, and palpi spatulate in female.

DISTRICT OF COLUMBIA: 1 ♀, Rock Creek, June 5 1925, (J. M. Aldrich), [U. S. N. M.].

ILLINOIS: 1 ♂, Dubois, May 23 1917, [Ill. N. H. S.].

MAINE: 1 ♂, Mount Desert, June 10 1921, (C. W. Johnson), [U. S. N. M.].

MARYLAND: 2 ♂, Plummers Island, August 3 1912; 2 ♂, Glen Echo, July 23 1921, (J. R. Malloch); 1 ♂, Cabin John, May 18 1915; 1 ♂, Chesoch, May 30, (J. M. Aldrich), [U. S. N. M.].

NEW HAMPSHIRE: 4 ♀, Noxon Camp, July 6 1931, (J. M. Aldrich), [U. S. N. M.].

NEW JERSEY: 1 ♀, Trenton, August 5, [A. N. S. P.].

NEW YORK: 1 ♂, Lakeville, Long Island, May 16 1921; 2 ♂, Middle Island, Long Island, May 30 1931; 1 ♀, Cold Spring Harbor, Long Island, September 10 1921; 1 ♀, Riverhead, Long Island, July 3 1927; 1 ♂, Orient, Long Island, June 20 1936; 1 ♂, Babylon, Long Island, June 26 1935; 1 ♂, Buttermilk, near Ithaca, July 18, 1920; 1 ♂, 3 ♀, Ringwood, near Ithaca, June 13 1922; 1 ♂, Ithaca, May 28 1922: 1 ♀, Harmon, July 6 1926, [H. C. H.]. 19 ♂, Wilmington Notch, Adirondacks, July 2 1922, (J. M. Aldrich), [U. S. N. M.].

OHIO: 3 ♂, Ira, no date, (J. S. Hine); 1 ♀, Vinton, June 5–12 1900; 1 ♂, Columbus, May 30 1901, [U. S. N. M.].

PENNSYLVANIA: 1 ♂, Natrona, July 14 1894, *cotype*, [Field Museum]. 3 ♂, Westmoor County, July, [Carnegie Museum]. 3 ♂, Delaware County, June 12 1894, [U. S. N. M.]. 1 ♂, Roxborough, Philadelphia, June 7; 1 ♀, Pocono Lake, August 21; 1 ♂, Germantown, Philadelphia, May 20, [A. N. S. P.].

SOUTH DAKOTA: 1 ♂, Elk Point, June 18 1924, [South Dakota State Col.].

TEXAS: 1 ♂, College Station, June 13 1919, [Texas A. & M. Col.].

VIRGINIA: 1 ♀, Occoquan, May 27 1923, (J. M. Aldrich), [U. S. N. M.].

WEST VIRGINIA: 1 ♀, Cheat River, June, [Carnegie Museum].

WISCONSIN: 1 ♂, Dane County, May 16 1936, (F. M. Snyder), [Univ. Wisc.]. 1 ♀, Brule River, Douglas County, August 23, (Witmer Stone), [A. N. S. P.].

Pegomyia connexa Stein

Pegomyia connexa Stein, Arch. f. Naturgesch., (1918), May, LXXXIV, (A), hft. 9, p. 68, 1920. Huckett, Mem. 77, N. Y. (Cornell) Agr. Exp. Station, (1923), p. 43, 1924. Johnson, Occ. Pap. Boston Soc. Nat. Hist., VII, p. 232, 1925. Johnson, Insect Fauna, Biol. Surv. Mt. Desert Region, p. 209, 1927. Huckett, Mem. 101, N. Y. (Cornell) Agr. Exp. Station, (1926), p. 840, 1928. Séguy, Gen. Insect., fasc. 205, p. 54, 1937.

Pegomyia emmesia Malloch, Trans. Amer. Ent. Soc., XLVI, p. 179, 1920. Malloch, Bull. Brooklyn Ent. Soc., XV, p. 125, 1920. Frison, Bull. Ill. Nat. Hist. Surv., XVI, p. 205, 1927.

Pogonomyia emmesia Séguy, Gen. Insect., fasc. 205, p. 319, 1937.

The species *connexa* has little in common with its congeners from North America known to me. It bears a striking resemblance to the european species *P. socculata* (Zetterstedt), from which it differs in having femora yellowish and not entirely blackened. The species has arista subplumose and mesonotum darkly streaked along declivities as in *lipsia;* in male the hind tibia invariably has a short bristle on proximal half of posterior surface, and in female the caudal pair of ocellar bristles is longish and directed outward, fifth abdominal tergum has discal bristles.

ALBERTA: 1 ♀, Edmonton, August 18 1936, (E. H. Strickland), [Univ. Alberta].

DISTRICT OF COLUMBIA: 1 ♂, Anacostia, May 13 1911, (P. Y. Myers), [U. S. N. M.].

ILLINOIS: 1 ♂, Savanna, June 14 1917; 1 ♀, same locality, June 11 1917, (J. R. Malloch), *type* and *allotype* of *emmesia* Mall., [Ill. N. H. S.].

MAINE: 1 ♀, Echo Lake, Mount Desert, June 1917, (C. W. Johnson), [U. S. N. M.].

MARYLAND: 1 ♂, Plummers Island, April 7 1907, (W. L. McAtee), [U. S. N. M.].

MICHIGAN: 1 ♀, Hamburg, Livingston County, July 19 1936, (Geo. Steyskal), [G. Steyskal].

MINNESOTA: 1 ♀, Duluth, St. Louis County, July 6–8, (Witmer Stone), [A. N. S. P.].

NEW HAMPSHIRE: 1 ♀, Noxon Camp, 2000 ft. alt., July 5 1931, (J. M. Aldrich), [U. S. N. M.].

NEW YORK: 1 ♂, Riverhead, Long Island, May 15 1924; 2 ♂, Hempstead, Long Island, May 4 1921; 1 ♀, Orient, Long Island, June 6 1936; 1 ♂, Lake Ridge, near Ithaca, May 6 1922; 1 ♀, Coy Glen, near Ithaca, June 12 1920; 2 ♂, Ithaca, May 15 1915; 2 ♂, McLean Bogs, McLean, May 17 1922; 1 ♀, Taughanic, near Ithaca, June 21 1920, (Leonard); 2 ♂, Ellis Hollow, near Ithaca, May 24 1922, [H. C. H.]. 3 ♀, Greene County, August, [Carnegie Museum].

OHIO: 1 ♀, Ira, no date; 1 ♂, Vinton, June 5–12 1900, (J. S. Hine), [U. S. N. M.].

ONTARIO: 1 ♂, Ottawa, May 23 1927, (C. H. Curran); 1 ♂, Niagara Glen, June 10 1926; 1 ♂, Point Pelee, July 25 1925, (G. S. Walley), [C. N. C.].

PENNSYLVANIA: 2 ♂, Westmoor County, no date; 2 ♀, Alleghany County, June, [Carnegie Museum]. 1 ♂, Philadelphia, September 14 1891, [U. S. N. M.].

QUEBEC: 1 ♂, Abbotsford, September 1 1936, (G. Shewell), [C. N. C.].

WASHINGTON: 1 ♂, Big Four Mountain, July 1 1924, (A. L. Melander), [A. L. M.].

WISCONSIN: 1 ♂, Dane County, May 21 1936, (F. M. Snyder), [Univ. Wisc.]. 1 ♀, Brule River, Douglas County, August 13, (Witmer Stone), [A. N. S. P.].

Pegomyia partita Huckett

Pegomyia partita Huckett, Trans. Amer. Ent. Soc., LXV, p. 33, 1939.

The species *partita* is only known to me in the female sex. In structure the species is allied to *labradorensis* Malloch and the european form *semirufa* Ringdahl, from both of which it differs by having the palpi and antennae blackish.

ALBERTA: 1 ♀, Banff, August 30 1922, (C. B. D. Garrett), *type*, [C. N. C.].
IDAHO: 1 ♀, Mountains, Moscow, July 25 1920, (R. C. Shannon), [H. C. H.].
WASHINGTON: 1 ♀, White River, Mount Rainier, July 20 1924, *paratype;* 1 ♀, Yakima Park, Mount Rainier, July 22 1924, (A. L. Melander), [A. L. M.].

Pegomyia labradorensis Malloch

Pegomyia labradorensis Malloch, Trans. Amer. Ent. Soc., XLVI, p. 176, 1920. Malloch, Bull. Brooklyn Ent. Soc., XV, p. 124, 1920. Frison, Bull. Ill. Nat. Hist. Surv., XVI, p. 206, 1927. Johnson, Psyche, XXXVI, p. 143, 1929.
Pogonomyia labradorensis Séguy, Gen. Insect., fasc. 205, p. 319, 1937.

The female of the species *labradorensis*, *partita* and the european form *semirufa* Ringdahl has the abdomen black and thorax reddish yellow. In the male the reddish abdomen may have a fuscous tinge. All three species have a strong bristle on distal half of anteroventral surface of mid femur. The male of *labradorensis* invariably has a bristle on proximal half of posterior surface of hind tibia and in neither sex is there a bristle at middle of anteroventral surface of mid tibia. It is not unlikely that *labradorensis* and *semirufa* may eventually be found to be the same species.

ALASKA: 1 ♂, Camp 327, Alaska "Eng. Comm.," July 31 1921, (J. M. Aldrich), [U. S. N. M.].
ALBERTA: 1 ♀, Waterton, July 13 1923, (E. H. Strickland), [Univ. Alberta].
LABRADOR: 1 ♂, Nain, August 1918, *type*, [Ill. N. H. S.].

Pegomyia lividiventris Huckett

Pegomyia lividiventris Huckett, Trans. Amer. Ent. Soc., LXV, p. 29, 1939.

The species *lividiventris* may readily be distinguished from allied forms in the *lipsia*-group by the more or less reddish tinge to abdomen. Structurally it comes closest to *fuscicauda*, and notably in the male sex. It differs chiefly from the latter species in having antennae largely yellowish, humeral callosities reddish, palpi en-

tirely yellowish and abdomen reddish translucent. The female of *lividiventris* has the fore tarsal segments uniformly slender as on mid tarsus, and mid tibia has an anteroventral bristle, whereas in *fuscicauda* the third and fourth fore tarsal segments are conspicuously broadened and mid tibia has no mid anteroventral bristle.

BRITISH COLUMBIA: 1 ♀, Nicola, May 7 1923, (E. R. Bucknell), [C. N. C.].

CALIFORNIA: 1 ♂, Falls, Forest Home, San Bernardino County, September 21 1935, (A. J. Basinger), *type*, [A. N. S. P.]. 1 ♀, Mount Home Canyon, San Bernardino Mts., June 8 1924, (J. M. Aldrich), *allotype;* 1 ♂, Gold Lake Camp, Plumas County, July 20 1916, (H. G. Dyar), [U. S. N. M.]. 1 ♀, Cuyamaca Mountains, San Diego County, August 16 1914, (J. C. Bradley), [C. U.].

IDAHO: 1 ♂, Waha, May 30 1924, (A. L. Melander), [A. L. M.].

NEVADA: 1 ♂, Tahoe Lake, (small lake, top of grade), October 5 1935, (A. J. Basinger), [A. J. Basinger].

WASHINGTON: 1 ♀, Olympia, June 4 1932, (C. H. Martin), [H. C. H.]. 1 ♀, Creston, June 27 1924, (A. L. Melander), [A. L. M.].

Pegomyia rumicifoliae new name

Pegomyia calyptrata Frost (not Stein), Journ. Agric. Research, XVI, p. 229–240, 1919. Malloch, Bull. Brooklyn Ent. Soc., XV, p. 123, 1920. Huckett, Ann. Ent. Soc. Amer., XIV, p. 312, 1921. Huckett, Mem. 77, N. Y. (Cornell) Agr. Exp. Station, (1923), p. 43, 1924. Frost, Mem. 78, N. Y. (Cornell) Agr. Exp. Station, (1923), p. 100, 1924. Johnson, Occ. Pap. Boston Soc. Nat. Hist., VII, p. 232, 1925. Johnson, Insect Fauna, Biol. Surv. Mt. Desert Region, p. 209, 1927. Huckett, Mem. 101, N. Y. (Cornell) Agr. Exp. Station, (1926), p. 840, 1928.

I have come to the conclusion that the species *Anthomyza calyptrata* Zetterstedt has yet to be correctly recorded as occurring in North America. I find that the specimens from Illinois and Massachusetts on which Stein (1898) partly based his knowledge of *calyptrata* do not belong to that species but are identical with those of *triseta* Malloch. Frost (1919) reared specimens of what he believed to be *calyptrata* from the leaves of *Rumex obtusifolius* and *R. crispus*, and this is the species that has come to be commonly recorded as *calyptrata* in recent North American literature. Another pegomyian species has been reared from *Rumex obtusifolius* in Europe, to which Hendel[35] has given the name *P. rumicicola*.

[35] Hendel, F. Neue europäische Minierfliegen (8. Beitrag zur Blattminenkunde Europas). *Konowia*, IV, hft. 5, p. 301–309, 1925.

The adult flies of this species differ from those reared by Frost in having the antennae, palpi, abdomen and legs black. In many respects the North American species agrees with the characters ascribed to *flavoscutellata* (Zetterstedt), a european form whose identity still remains a matter of considerable uncertainty. Ringdahl (1938) has however concluded that the species *calyptrata* (Zetterstedt) and *P. iniqua* Stein are identical, the latter having been described from specimens reared from *Agaricus campestris*. If this synonymy be accepted then it is apparent that Zetterstedt's species is not the same as that which has recently been recorded from North America as *calyptrata*.

I have renamed Frost's leaf-mining species *Pegomyia rumicifoliae*, in view of the apparent error in identification. The species differs from *calyptrata* in having a longer prealar bristle, more closely approximated series of acrostical bristles, larger and more strongly bristled processes in male, being similar to *nigritarsis* in this respect, and by the absence of cruciate bristles in female. I have placed *rumicifoliae* and *nigritarsis* in the same subgroup, the former species differing from the latter in having palpi yellow, scutellum and third antennal segment partly yellow. The two species differ from *bicolor* and *triseta* in structure and bristling of male processes and by the weaker development of apical posterodorsal bristle of hind tibia in both sexes. In all such species there occurs not infrequently a certain degree of blackish suffusion in the abdomen, which may become so extensive in extreme cases as to nearly mask the normal reddish color. In *rumicifoliae* the prealar bristle may be slightly longer or shorter than anterior notopleural bristle, and humeral callosities in male may be black or apparently yellowish testaceous.

MASSACHUSETTS: 1 ♀, Brookline, Aug. 25.

NEW JERSEY: 1 ♀, Trenton, July 2, [A. N. S. P.].

NEW YORK: 3 ♂, 3 ♀, Ithaca, September 9, 1902 (*ex Rumex crispus*); 1 ♀, Coy Glen, near Ithaca, May 14 1922; 1 ♂, McLean Bogs, McLean, May 7 1922, [H. C. H.].

ONTARIO: 1 ♂, Trenton, September 9 1902, (Evans). 1 ♂, Burlington, 1919. 1 ♀, Ottawa, June 18 1916, [H. C. H.]. 1 ♂, 1 ♀, Ottawa, July 5 1938, (G. E.

Shewell); 1 ♀, Low Bush, Lake Abitibi, June 4 1925, (N. K. Bigelow). 1 ♀, Orillia, June 10 1925, (C. H. Curran), [C. N. C.].

QUEBEC: 1 ♀, Fairy Lake, June 1 1927, (G. S. Walley), [C. N. C.].

RHODE ISLAND: 1 ♂, Newport, [A. N. S. P.].

WISCONSIN: 1 ♀, Dane County, July 26 1937, (F. M. Snyder), [Univ. Wisc.].

Pegomyia nigritarsis (Zetterstedt)

Anthomyza nigritarsis Zetterstedt, Ins. Lapp., p. 696, 1838.

Pegomyia nigritarsis Stein, Kat. Paläark. Dipt., III, p. 705, 1907. Schnabl, Hor. Soc. Ent. Ross., XXXIV, p. 8, 9, 1910. Schnabl, Deutsch. Ent. Zeitschr., hft. 6, p. 82, 1911. Stein, Arch. f. Naturgesch., (1915), (A), hft. 10, p. 126, 1916. Ringdahl, Trømso Museums Årshefter, (1926), XLIX, hft. 3, p. 32, 1928. Karl, Tierwelt Deutschlands, XIII, pt. 3, p. 138, 1928. Curran, Bull. Amer. Mus. Nat. Hist., LXI, p. 85, 1930. Ringdahl, K. Svensk. Veten. Kap. Akad. Skrift. Naturskyddsärenden, nr. 18, p. 21, 1931. Tiensuu, Acta Soc. Faun. Flor. Fennica, LVIII, no. 4, p. 29, 1935. Séguy, Gen. Insect. fasc. 205, p. 60, 1937.

Pegomyia (*Pegomyia*) *nigritarsis* Schnabl and Dziedzicki, Abh. K. Leop.-Carol. Deutsch. Akad. Naturforsch., XCV, nr. 2, p. 112, 1911. Séguy, Faune de France, VI, p. 163, 1923. Ringdahl, Ent. Tidskr., LIX, p. 199, 1938.

The males of *nigritarsis* and *rumicifoliae* have broad lamellate processes which are fringed along entire inner margin by a dense series of slender setulae. The male specimen before me from Alaska differs from the normal form of *nigritarsis* in that humeral callosities and scutellum are partly yellowish.

ALASKA: 1 ♂, Katmai, June, 1917, (J. S. Hine), [Ohio State Univ.].

Pegomyia costalis Stein

Pegomyia costalis Stein, Berl. Ent. Zeitschr., (1897), XLII, p. 243, 1898. Coquillett, Proc. Wash. Acad. Sci., II, p. 451, 1900. Coquillett, Psyche, IX, p. 150, 1901. Aldrich, Misc. Coll. Smithsn. Inst., XLVI, no. 1444, p. 558, 1907. Stein, Arch. f. Naturgesch., (1917), LXXXIII, (A), hft. 1, p. 148, 1919. Stein, Arch. f. Naturgesch., (1918), LXXXIV, (A), hft. 9, p. 64, 1920. Séguy, Gen. Insect., fasc. 205, p. 54, 1937.

The male of *costalis* resembles that of *substriatella*, from which it may be distinguished by the longer costal setulae, longer pubescence of arista, and yellow halteres. The species is only known to me through the type which was taken at Brookings, South Dakota, and is deposited in the Field Museum at Chicago.

Pegomyia substriatella (Malloch) (Figs. 12, 45, 73.)

Hylemyia substriatella Malloch, Trans. Amer. Ent. Soc., XLIV, p. 309, 1918. Frison, Bull. Ill. Nat. Hist. Surv., XVI, p. 203, 1927. Séguy, Gen. Insect., fasc. 205, p. 116, 1937.

Pegomyia substriatella Malloch, Bull. Brooklyn Ent. Soc., XV, p. 125, 1920.

The species *substriatella* is more robust than *costalis*, and lacks the series of prominently long costal setulae. In the female of *substriatella* the fore tarsal segments are slender. Both *costalis* and *substriatella* may be distinguished from the allied form *quadrispinosa* by their reddish second antennal segment, strongly developed apical posterodorsal bristle on hind tibia, and by the lack of a bristle on distal half of anteroventral surface of mid femur. In the male of *costalis* and *substriatella* the abdominal sterna have numerous erect slender bristles, whereas in *quadrispinosa* the sterna possess a few unnoteworthy bristles.

DISTRICT OF COLUMBIA: 1 ♂, 1 ♀, Washington, October 29, 1926, (N. K. Bigelow), [U. S. N. M.].

MARYLAND: 1 ♂, Glen Echo, October 22 1926, (N. K. Bigelow); 1 ♂, Hyattsville, October 26 1916, (B. P. Currie); 1 ♀, Cabin John, October 30 1926, (J. M. Aldrich), [U. S. N. M.].

OHIO: 1 ♂, Columbus, October 4, [U. S. N. M.].

VIRGINIA: 1 ♂, Dead Run, Fairfax County, October 28 1915, (R. C. Shannon), [H. C. H.]. 1 ♂, Falls Church, October 14 1913, (C. T. Greene), *type*, [Ill. N. H. S.]. 1 ♂, Great Falls, October 23 1920, (J. M. Aldrich), [U. S. N. M.].

Pegomyia flavicans (Stein)

Hylemyia flavicans Stein, Berl. Ent. Zeitschr., (1897), XLII, p. 213, 1898. Aldrich, Misc. Coll. Smithsn. Inst., XLVI, no. 1444, p. 552, 1905.

Pegomyia flavicans Stein, Arch. f. Naturgesch., (1917), LXXXIII, (A), hft. 1, p. 148, 1919. Stein, Arch. f. Naturgesch., (1918), LXXXIV, (A), hft. 9, p. 65, 1920. Malloch, Bull. Brooklyn Ent. Soc., XV, p. 125, 1920. Séguy, Gen. Insect., fasc. 205, p. 54, 1937.

The species *flavicans* structurally is similar to *quadrispinosa*, from which it differs in being paler in color, in having second antennal segment and part of third reddish, and by the yellow palpi. The species is known to me through the cotype series, two males and a female taken in South Dakota. One male cotype is deposited in the United States National Museum, the other two specimens in the Zoological Museum of the University of Berlin.

I am doubtful whether the male and female cotypes at Berlin are conspecific owing to the fact that the female specimen lacks the diagnostic characters of the mid femur and fore tibia, which I regard to be of specific importance. A female specimen from Manitoba, which I believe to be conspecific with the male cotypes, has a bristle present on distal half of anteroventral surface of mid femur and at apex of posterodorsal surface of fore tibia, as in male.

Pegomyia tarsata (van der Wulp) (Figs. 16, 43, 76.)

Anthomyia tarsata van der Wulp, Tijdschr. Ent., x, p. 151, 1867. Osten Sacken, Misc. Coll. Smithsn. Inst., III, p. 168, 1878. Aldrich, Misc. Coll. Smithsn. Inst., XLVI, no. 1444, p. 551, 1905.

The species *tarsata* was described by van der Wulp (1867) from two female specimens taken in Wisconsin, which are preserved in the 'S Rijks Museum at Leyden. One of the specimens is, in my opinion, identical with *Anthomyia lipsia* Walker, and the other belongs to a different species. There is little to indicate from the material itself or from the description of *tarsata* as to which specimen may have been the chief source for the description. It seems probable that both specimens were consulted for this purpose. The specimen not *lipsia* differs from *lipsia* in having parafacials and cheeks broader, mesonotum with no conspicuous blackish streaks along declivities, fore tibia with a robust apical posterodorsal bristle, mid tibia with a weak mid anteroventral bristle. This specimen I designate the lectotype of *tarsata* van der Wulp.

I have little doubt but that the series of females before me belong to this species, the chief apparent difference being that the wings are more yellowish tinged than in lectotype. In addition, the male is recorded from collections made in Wisconsin and Manitoba. It differs from that of *lipsia* in that the processes are entirely yellowish, fore tibia has a robust apical posterodorsal bristle, and eyes are separated by a distance greater than diameter of anterior ocellus.

In both *anorufa* Stein and *subgrisea* Malloch the processes are yellowish as in *tarsata*, but the males of the two former species differ from that of the latter in having a bristle on distal half of

anteroventral surface of mid femur, second antennal segment partly blackish, and eyes more widely separated at narrowest part of frons.

ALASKA: 1 ♀, Nenana, June 27 1921, (J. M. Aldrich), [U. S. N. M.]. 1 ♀, Katmai, August 1917, (J. S. Hine), [Ohio State Univ.].

ALBERTA: 1 ♀, Edmonton, June 7 1935; 1 ♀, Elk Island, August 4 1923, (E. H. Strickland); 1 ♂, Cooking Lake, May 24 1937; 1 ♀, Wetaskiwin, June 6 1937, (F. O. Morrison), [Univ. Alberta].

MANITOBA: 1 ♂, Aweme, May 6 1925, (R. D. Bird); 1 ♂, Teulon, August 1 1924, [C. N. C.].

NEW BRUNSWICK: 1 ♀, Frederickton, September 24 1914, (F. M. McKenzie), [C. N. C.].

ONTARIO: 1 ♀, Macdiarmid, Lake Nipigon, September 11 1923, (N. K. Bigelow), [C. N. C.]. 1 ♂, Waubamick, June 1915, (H. S. Parish), [A. L. M.].

QUEBEC: 1 ♀, Queens Park, Aylmer, July 14 1926, (C. B. Hutchings), [C. N. C.].

SASKATCHEWAN: 1 ♀, Saskatoon, June 23 1926, (K. M. King), [C. N. C.].

SOUTH DAKOTA: 1 ♀, Spearfish, August 2 1924, [H. C. H.].

WISCONSIN: 1 ♂, Madison, May 16 1938; 1 ♂, Dane County, July 7 1936, (F. M. Snyder). 1 ♀, Racine, May 23 1932, [Univ. Wisc.].

Pegomyia cresca Huckett

Pegomyia cresca Huckett, Trans. Amer. Ent. Soc., LXV, p. 30, 1939.

The species *cresca* is related to *tarsata*, differing in that the male processes are blackish and concolorous with abdomen, second and third fore tarsal segments in female more restricted in size. Allied forms include *duplicata* (Malloch) and *longimana* (Pokorny), in both of which the second antennal segment is largely blackish and fore tarsal segments in female are slender, as in mid tarsus.

ALASKA: 1 ♂, Healey, June 24 1921, (J. M. Aldrich), [U. S. N. M.].

ALBERTA: 1 ♂, Banff, June 9 1922; 1 ♀, Waterton Lakes, June 19 1923, (J. McDunnough); 1 ♂, 1 ♀, Waterton, July 13 1923, (H. L. Seamans), [C. N. C.]. 1 ♂, Gull Lake, July 7 1932, (E. H. Strickland), *paratype*, [A. N. S. P.].

BRITISH COLUMBIA: 1 ♂, Cranbrook, June 3 1926, (A. A. Dennys), *type;* 1 ♀, Keremeos, July 31 1923, (C. B. D. Garrett), *allotype*, [C. N. C.]. 1 ♂, Hedley, July 20 1923. 1 ♀, Carbonate to Columbia River, July 7–12 1908, 2600 ft. alt., (J. C. Bradley), [C. U.]. 1 ♀, Mount Cheam, August 15 1901, [H. C. H.].

COLORADO: 1 ♀, Lake City, August 15 1936, 8700 ft. alt.; 1 ♂, Boulder County, June 18–July 19 1933, 9500 ft. alt., (J. C. Jones), [Univ. Wisc.].

IDAHO: 1 ♀, Potlatch, May 28 1930, (J. M. Aldrich), [U. S. N. M.].

SOUTH DAKOTA: 1 ♂, Spearfish, July 28 1924; 1 ♀, Custer, July 19 1924, [South Dakota State Col.].

WASHINGTON: 1 ♂, Asotin, May 11 1923, (A. L. Melander), [A. L. M.].

WYOMING: 1 ♂, Yellowstone National Park, Old Faithful, August 11 1927, (J. M. Aldrich), [U. S. N. M.]. 1 ♂, Yellowstone National Park, Norris Basin, July 26 1923, (A. L. Melander), [A. L. M.].

Pegomyia lipsia (Walker)

Anthomyia lipsia Walker, List Dipt. Brit. Museum, IV, p. 928, 1849. Osten Sacken, Misc. Coll. Smithsn. Inst., no. 270, p. 168, 1878.

Anthomyia substituta Walker, List Dipt. Brit. Museum, IV, p. 971, 1849.

Hylemyia lipsia Slosson, Ent. News, VI, p. 6, 1895. Stein, Berl. Ent. Zeitschr., (1897), XLII, p. 209, 1898. Stein, Zeitschr. Hymn. Dipt., II, p. 200, 1901. Aldrich, Misc. Coll. Smithsn. Inst., XLVI, no. 1444, p. 552, 1905. Smith, Ann. Rept. N. J. State Museum, 1909, p. 791, 1910. Huckett, Ann. Ent. Soc. Amer., XIV, p. 309, 1921. Cole and Lovett, Proc. Cal. Acad. Sci., XI, p. 312, 1921.

Pegomyia lipsia Stein, Arch. f. Naturgesch., (1917), LXXXIII, (A), hft. 1, p. 148, 1919. Stein, Arch. f. Naturgesch., (1918), LXXXIV, (A), hft. 9, p. 72, 1920. Malloch, Bull. Brooklyn Ent. Soc., XV, p. 125, 1920. Huckett, Mem. 77, N. Y. (Cornell) Agr. Exp. Station, (1923), p. 45, 1924. Johnson, Occ. Pap. Boston Soc. Nat. Hist., VII, p. 232, 1925. Huckett, Mem. 101, N. Y. (Cornell) Agr. Exp. Station, (1926), p. 840, 1928. Curran, Bull. Amer. Mus. Nat. Hist., LXI, p. 85, 1930. Huckett, Can. Ent., LXVI, p. 137, 1934. Séguy, Gen. Insect., fasc. 205, p. 59, 1937.

The species *lipsia* has the second and base of third antennal segment and fore coxae broadly yellowish, palpi deeply infuscated distad, fore tibia has no robust apical posterodorsal bristle. In the male the ventral surface of abdomen is densely clothed with uniformly fine erect setulae, and second and third sterna are subquadrate in outline. In female the mesonotum when viewed from behind has a prominent blackish streak along the declivities, third and fourth fore tarsal segments greatly enlarged and mid tibia has no mid anteroventral bristle. The species may be distinguished invariably from its closest relatives by the lack of a robust apical posterodorsal bristle on fore tibia, and in the male sex by the closely approximated eyes at narrowest part of froms and by the fine denser vestiture on ventral surface of abdomen.

ALBERTA: 1 ♂, Wabamun, June 27 1936; 1 ♀, Edmonton, September 1 1936, (E. H. Strickland); 1 ♂, same locality, August 22 1937, (F. O. Morrison), [Univ. Alberta].

ARIZONA: 1 ♂, Santa Rita Mountains, May 20 1898, (Schwarz), [U. S. N. M.].

CONNECTICUT: 10 ♂, Woodbury, June 8 1931; 1 ♂, Redding, June 11 1929, (A. L. Melander), [A. L. M.].

ILLINOIS: 1 ♂, Algonquin, no date, [U. S. N. M.].

INDIANA: 1 ♂, Lafayette, May 2 1917, [U. S. N. M.].

MARYLAND: 1 ♂, Plummers Island, April 22 1903, [U. S. N. M.].

MASSACHUSETTS: 1 ♂, Barnstable, August 19 1926, (A. L. Melander), [A. L. M.]

MICHIGAN: 1 ♂, South Haven, June 23 1938; 1 ♂, Saint Joseph, May 30 1938, (C. W. Sabrosky), [Mich. State Col.].

NEW BRUNSWICK: 1 ♀, Kentville, July 18 1923, (R. P. Gorham), [C. N. C.].

NEW HAMPSHIRE: 1 ♀, White Mountains, no date, (Morrison), [U. S. N. M.]. 1 ♂, Banton, July 6, (A. L. Melander), [A. L. M.].

NEW YORK: 1 ♂, Lake Placid, July 28 1929, (A. L. Melander), [A. L. M.]. 4 ♂ Taughanic Falls, near Ithaca, August 14 1928; 2 ♂, Coy Glen, near Ithaca, May 23 1922; 3 ♂, Ithaca, May 28 1922; 1 ♀, Montezuma Marsh, Cayuga County, July 1 1920; 1 ♂, Lakeside Park, August 8 1921, (M. D. Leonard); 1 ♂, 1 ♀, Ringwood, near Ithaca, August 17 1928, [H. C. H.]. 2 ♂, 2 ♀, Onteora Mountains, Greene County, 1929, (L. O. Howard), [U. S. N. M.]. 1 ♂, Poughkeepsie, May 12 1910; 1 ♂, 1 ♀, Riverhead, Long Island, August 20 1922; 1 ♂, Babylon, Long Island, May 22 1935; 1 ♀, West Hills, Long Island, June 1 1935; 1 ♀, Farmingdale, Long Island, June 14 1935, (F. S. Blanton); 1 ♂, Yaphank, Long Island, August 8 1926, [H. C. H.].

OHIO: 1 ♂, Amherst, July 1933, (H. J. Reinhard), [Texas A. &. M. Col.]. 1 ♂, Cuyhga Fls., August 10 1904, [U. S. N. M.].

ONTARIO: 1 ♂, Niagara Glen, June 15 1926, (G. S. Walley); 1 ♂, Spencerville, June 10 1936, (G. E. Shewell); 1 ♀, Waubamick, June 1915, (H. S. Parish), [A. L. M.].

PENNSYLVANIA: 5 ♂, 1 ♀, Westmoor County, July; 1 ♀, Ohio Pyle, August 10 1905, (Carnegie Museum). 1 ♂, Philadelphia, July 5 1934; 1 ♂ Broomall, May 13 1934, (D. E. Hardy), [Brigham Young University]. 2 ♂, Dubois, September 3 1927; 1 ♂, Mineral Spring, September 5 1927, (A. L. Melander), [A. L. M.]. 3 ♂, Wernersville, August 15, [A. N. S. P.].

QUEBEC: 1 ♀, Quebec, August 5 1930, (A. L. Melander), [A. L. M.]. 1 ♂, Aylmer, August 16 1926, (C. H. Curran); 1 ♂, Abbotsford, June 1935, (G. E. Shewell), [C. N. C.].

VIRGINIA: 2 ♂, Chain Bridge, September 11 1921; 2 ♂, Turkey Run, October 1921 (J. R. Malloch), [U. S. N. M.].

WEST VIRGINIA: 1 ♀, Cheat River, June, [Carnegie Museum].

WISCONSIN: 2 ♂, Iowa County, August 25 1935; 6 ♂, Dane County, May 16 1936; 1 ♀, Devils Lake, May 30 1936; 2 ♂, Madison, May 13 1936, (F. M. Snyder), [Univ. Wisc.]. 1 ♀, Salmo, Bayfield County, August 12 1919, [U. S. N. M.].

Pegomyia chrysida Huckett

Pegomyia chrysida Huckett, Trans. Amer. Ent. Soc., LXV, p. 27, 1939.

The species *chrysida* and *fuscicauda* evidently possess much the same range in geographical distribution and they also have much in common in general appearance. In *chrysida* the second antennal segment, proximal area of third segment, fore coxae and greater part of palpi are yellowish, whereas in *fuscicauda* these sclerites are largely blackish or fuscous. In the keys *chrysida* and *lipsia* are intimately associated. However the former species may be readily distinguished from the latter by the clouded cross veins and less intensively tinged wing membrane, and in the male by the sparser vestiture on ventral surface of abdomen and narrower sternal sclerites.

ARIZONA: 1 ♀, Cave Creek Canyon, Chiricahua Mts., 5500 ft. alt., no date, *allotype*, [A. N. S. P.]. 1 ♀, Huach Mountains, 1929, [H. C. H.].

CALIFORNIA: 1 ♂, Forest Home, 5200 ft. alt., May 18 1934, (A. J. Basinger), *type*, [A. N. S. P.]. 1 ♂, Falls, Forest Home, San Bernardino County, September 21 1935, (A. J. Basinger), [A. J. Basinger]. 1 ♀, Mill Creek Canyon, San Bernardino Mountains, June 7 1924, (J. M. Aldrich), *paratype*, [U. S. N. M.].

OREGON: 1 ♂, Alsea, May 25 1920, (Loring G. Hudson); 1 ♂, Corvallis, August 22 1924, (H. A. Scullen); 1 ♀, Kiger's Island, May 23 1930; 1 ♂, Newport, August 20 1929, (R. E. Dimick), [Ore. State Col.].

UTAH: 1 ♂, Deep Creek Mts., June 1928, (Vasco M. Tanner); 1 ♂, Provo, no. date, (D. E. Hardy); 1 ♂, Orem, June 17, 2 ♂, Riverton, June 18 1937; 1 ♀, Lindon, June 25 1937, (L. L. Hansen), [Utah Agr. Col.].

WYOMING: 1 ♂, Yellowstone Park, July 22 1939, (Harvey Roberts), [F. M. Snyder].

Pegomyia banffi Huckett

Pegomyia banffi Huckett, Trans. Amer. Ent. Soc., LXV, p. 33, 1939.

The species *banffi* may be distinguished from related forms by the possession of the following combination of characters: Mid femur with a bristle on distal half of anteroventral surface, hind tibia with a bristle on proximal half of posterior surface, fore tibia with apical posterodorsal bristle setulose. The eyes in male are closely approximate and the cerci (upper forceps) are peculiarly clothed with a dense pubescence.

ALBERTA: 1 ♂, Banff, June 28 1917. 2 ♂, Lake Louise, July 26 1917, [H. C. H.]. 1 ♂, Banff, July 30 1922, (C. B. D. Garrett), *type*, [C. N. C.].

WASHINGTON: 1 ♂, Mount Rainier, Yakima Park, July 26 1932, *paratype;* 1 ♂, Mount Rainier, Whiite River, July 20 1924, (A. L. Melander), [A. L. M.].

WYOMING: 1 ♀, Larva Creek, Yellowstone Park, July 5 1923, (A. L. Melander), *allotype*, [A. L. M.].

Pegomyia frigida (Zetterstedt) (Figs. 15, 46, 79.)

Anthomyia frigida Zetterstedt, Dipt. Scand., IV, p. 1685, 1845. Siebke, Enum. Insect. Norveg., IV, p. 121, 1877.

Pegomyia bivittata Stein, Wien. Entom. Zeitg., XXV, p. 98, 1906. Stein, Arch. f. Naturgesch., (1913), LXXIX, (A), hft. 8, p. 34, 1914. Stein, Arch. f. Naturgesch., (1915), LXXXI, (A), hft. 10, p. 124, 1916. Stein, Arch. f. Naturgesch., (1918), LXXXIV, (A), hft. 9 p. 65, 1920. Karl, Tierwelt Deutschlands, XIII, pt. 3, p. 131, 1928.

Pegomyia frigida Stein, Kat. Paläark. Dipt., III, p. 702, 1907. Ringdahl, Arkiv. Zool., XXI, A, no. 20, p. 5, 1930. Ringdahl, Ent. Tidskr., LIII, hft. 3, p. 174, 1931. Ringdahl, K. Svensk. Veten. Kap. Akad. Skrift. Naturskyddsärenden, nr. 18, p. 21, 1931. Tiensuu, Acta Soc. Faun. Flor. Fennica, LVIII, no. 4, p. 28, 1935. Séguy, Gen. Insect., fasc. 205, p. 55, 1937.

Pegomyia lativittata Malloch, Ohio Jour. Science, XX, p. 272, 1920. Malloch, Bull. Brooklyn Ent. Soc., XV, p. 125, 1920. Séguy, Gen. Insect., fasc. 205, p. 59, 1937.

Pegomyia (*Pegomyza*) *frigida* Ringdahl, Ent. Tidskr., LIX, p. 194, 1938.

The species *frigida* is related to *banffi* and *caduca*, the males of which have the eyes closely approximate and costal setulae inconspicuously developed. In *frigida* the thorax and abdomen are blacker and more highly shining, the mesonotum has well marked streak along lateral declivities, as in *lipsia*, the hypopygium is shining black, fore tibia has a robust apical posterodorsal bristle, and hind tibia has no proximal bristle on posteroir surface. In the specimens before me the fore tibiae are invariably distinctly darker than mid or hind tibiae, and they possess two posteroventral bristles. In female the second, third and fourth fore tarsal segments are narrowly broadened and bristles on posteroventral surface of mid and hind femora are weakly developed.

ALASKA: 1 ♂, Savonoski, Lake Naknek, July 1919, (J. S. Hine), [Ohio State Univ.].

IDAHO: 1 ♀, Moscow Mountain, August 26 1923, (A. L. Melander), [A. L. M.].

NEW HAMPSHIRE: 2 ♀, Monadnock, June 11 1932, (A. L. Melander), [A. L. M.].

ONTARIO: 1 ♀, Macdiarmid, June 27 1922, (N. K. Bigelow), [C. N. C.].

WASHINGTON: 1 ♂, Mount Rainier, White River Camp, September 11 1932; 1 ♀, Mount Rainier, Sunrise, August 28 1932, 6380 ft. alt., (J. Wilcox); 1 ♂, Mount Rainier, Shadow Lake, August 15 1932, 6500 ft. alt., (C. H. Martin), [H. C. H.]. 2 ♀, Mount Rainier, Skyline Trail, August 10 1925, (A. L. Melander), [A. L. M.].

Pegomyia caduca Huckett

Pegomyia caduca Huckett, Trans. Amer. Ent. Soc., LXV, p. 35, 1939.

The species *caduca* closely resembles *frigida* (Zetterstedt), from which it may be distinguished by the absence of yellowish coloration to wings and calyptrae, lack of lustre or sheen to abdomen and thorax, absence of lateral markings on mesonotum, and by the pruinescence on hypopygium of male.

WASHINGTON: 1 ♂, Mount Rainier, Yakima Trail, July 22 1924, (A. L. Melander), *type*, [A. L. M.].

WYOMING: 1 ♀, Yellowstone Park, Crescent Hill, July 5 1923, (A. L. Melander), *allotype*, [A. L. M.].

Pegomyia anorufa Stein

Pegomyia anorufa Stein, Arch. f. Naturgesch., (1918), LXXXIV, (A), hft. 9, May p. 67, 1920. Séguy, Gen. Insect., fasc. 205, p. 52, 1937.

Pegomyia subgrisea Malloch, Trans. Amer. Ent. Soc., XLVI, p. 180, 1920. Malloch, Bull. Brooklyn Ent. Soc., XV, p. 125, 1920. Frison, Bull. Ill. Nat. Hist. Surv., XVI, p. 206, 1927.

Pogonomyia subgrisea Séguy, Gen. Insect., fasc. 205, p. 320, 1937.

I have not seen the type of *anorufa* Stein, but there seems to me little doubt regarding the probable validity of the above synonymy. The species, as indicated by the type of *subgrisea*, bears a relationship to *tarsata*. It may be readily distinguished from the latter species by the presence of a bristle on distal half of anteroventral surface of mid femur, and by the blackish second antennal segment. In addition the male of *subgrisea* has the eyes more widely separated across frons and the costal setulae more conspicuously developed than in related species.

ALBERTA: 1 ♀, Waterton, June 19 1932, (H. L. Seamans), [C. N. C.].

MONTANA: 1 ♂, Bozeman, June 14 1906, *type* of *subgrisea* Mall., [Ill. N. H. S.].

WYOMING: 1 ♀, Yellowstone Park, Crescent Hill, July 5 1923, (A. L. Melander), [A. L. M.].

Pegomyia quadrispinosa Malloch (Figs. 11, 40, 72.)

Pegomyia quadrispinosa Malloch, Trans. Amer. Ent. Soc., XLVI, p. 181, 1920. Malloch, Bull. Brooklyn Ent. Soc., XV, p. 125, 1920. Frison, Bull. Ill. Nat. Hist. Surv., XVI, p. 206, 1927.

Pogonomyia quadrispinosa Séguy, Gen. Insect., fasc. 205, p. 319, 1937.

The species *quadrispinosa* has the habitus of *substriatella*, *flavicans* and *apicalis*. It may be distinguished readily from *flavicans* and *substriatella* by the blackish second antennal segment, and from the male of *apicalis* by the entirely reddish mid and hind femora. The females of *quadrispinosa* and *apicalis* are much alike, both having mid and hind femora entirely reddish. However in *quadrispinosa* the female may usually be distinguished from that of *apicalis* by the intensive yellowish color of wing veins proximad, and by the yellowish calyptrae. All the foregoing species and those of *frigida*, *anorufa* and *banffi* are characterized by the possession of a bristle on distal half of anteroventral surface of mid femur and further by the absence of accessory setulae on notopleural callosity. In the female of *quadrispinosa*, *substriatella*, *flavicans* and *apicalis* the fore tarsal segments are slender, whereas in the female of *anorufa*, *frigida* and *banffi* the third and fourth fore tarsal segments are broadened.

ALBERTA: 1 ♂, Waterton, July 22 1923, (H. L. Seamans), [C. N. C.]. 1 ♂, 3 ♀, same locality, July 14 1923; 1 ♀, Wabamun, August 2 1936, (E. H. Strickland), [Univ. Alberta].

CALIFORNIA: 1 ♀, Fallen Leaf, July 17 1917, 6500 ft. alt., (J. M. Aldrich), [U. S. N. M.].

COLORADO: 1 ♂, Tennessee Pass, July 24 1917, 10240 ft. alt., (J. M. Aldrich), [U. S. N. M.]. 1 ♀, Pingree Park, August 20 1935, 9000 ft. alt., [Univ. Wisc.].

MONTANA: 1 ♂, Gallatin County, July 9 1900, 9400 ft. alt., (C. Koch), *type*, [Ill. N. H. S.]. 1 ♀, Monida, June 27 1913, *allotype*, [Ill. Nat. Hist. Surv.].

OREGON: 1 ♂, 1 ♀, Anthomy Lake, Blue Mts., August 3 1929, 7100 ft. alt., (H. A. Scullen), [Ore. State Col.].

UTAH: 3 ♂, Blue Lake, La Sal Mts., 9500 ft. alt., no date, (Vasco M. Tanner), [Utah Agr. Col.].

WASHINGTON: 6 ♂, 2 ♀, Mount Rainier, Sunrise, August 13 1931, 6318 ft. alt.; 1 ♀, Mount Rainier, White River Entrance, August 4 1931, (J. Wilcox); 1 ♀, Mount Rainier, Shadow Lake, August 24, 6500 ft. alt., (C. H. Martin), [H. C. H.]. 6 ♂, 3 ♀, Mount Rainier, Yakima Park, July 22 1924; 1 ♂, 1 ♀, Mount Rainier, Summerland, July 24 1924; 1 ♂, Mount Rainier, White River, July 23 1924; 2 ♂, Swank Creek, June 28 1924, (A. L. Melander), [A. L. M.].

WYOMING: 1 ♀, Yellowstone Park, Old Faithful, September 30, 1924, (N. Criddle), [C. N. C.]. 1 ♂, Yellowstone Park, 4 miles south of Thumb Station, July 17 1923; 1 ♂, 1 ♀, Yellowstone Park, Beach Springs, July 19 1923; 1 ♂, Yellowstone Park, Thumb Station, July 16 1923; 2 ♂, Yellowstone Park, North-

west Entrance, July 27 1923; 1 ♂, Yellowstone Park, Swan Lake, July 10 1923; 1 ♂, Yellowstone Park, Indian Creek, July 8 1923; 1 ♀, Yellowstone Park, Turbid Lake, July 20 1923; 1 ♀, Yellowstone Park, lake, July 18 1923, (A. L. Melander), [A. L. M.].

Pegomyia setiformis Huckett

Pegomyia setiformis Huckett, Trans. Amer. Ent. Soc., LXV, p. 32, 1939.

The species *setiformis* is undoubtedly closely allied to the coastal and southern form *fuscicauda*. Because of the tendency for some of the differentiating characters to vary in *fuscicauda* there may be difficulties in distinguishing the two species if too much credence is placed in the key for this purpose. However in *setiformis* all the specimens before me possess a robust apical posterodorsal bristle on hind tibia and a weak mid anteroventral bristle on mid tibia, whereas in all specimens of *fuscicauda* that I have seen the former character is weakly developed and the latter is not present. The males of *setiformis* and *fuscicauda* may be distinguished from those of such related forms as *duplicata* and *longimana* (Pokorny) by the black subshining hypopygial sclerites which contrast sharply with the pale tergal pruinescence, and by the addition of accessory bristles on basal sclerite of hypopygium in addition to those that encircle the puckered area on the dorsocentral plane. In *duplicata* and *longimana* the hypopygium is grayish pruinescent and concolorous with abdominal terga and there are no additional bristles on basal sclerite beside the single semicircular series bordering the puckered area.

In the female of *setiformis* and *fuscicauda* the second, third and fourth fore tarsal segments are broadened, whereas in *duplicata* and *longimana* these segments are uniformly slender as in mid tarsus.

ALBERTA: 1 ♂, 1 ♀, Waterton, July 12 1923, (H. L. Seamans), *type* and *allotype;* 1 ♀, Banff, July 17 1922, (C. B. D. Garrett); 1 ♀, Moraine Lake, August 4 1923, (J. McDunnough), [C. N. C.].

BRITISH COLUMBIA: 1 ♀, Kamloops, May 23 1923, (E. R. Buckell), [C. N. C.].

IDAHO: 1 ♂, Potlatch, May 28 1930, [H. C. H.].

WASHINGTON: 1 ♀, Pullman, May 13 1923, (A. L. Melander), [A. L. M.].

WYOMING: 1 ♂, Yellowstone Park, Crescent Hill, July 5 1923, (A. L. Melander), [A. L. M.].

Pegomyia duplicata (Malloch) (Figs. 14, 42, 75.)

Hylemyia duplicata Malloch, Trans. Amer. Ent. Soc., XLIV, p. 308, 1918. Frison, Bull. Ill. Nat. Hist. Surv., XVI, p. 201, 1927. Séguy, Gen. Insect., fasc. 205, p. 90, 1937.

Pegomyia fuscinervis Stein, Arch. f. Naturgesch., (1918), LXXXIV, (A), hft. 9, p. 69, 1920. Séguy, Gen. Insect., fasc. 205, p. 56, 1937.

The species *duplicata* is closely allied to *longimana* (Pokorny) in that the sclerites of the hypopygium are grayish opaque, concolorous with abdomen, and the bristles on the basal sclerite of hypopygium are in a single series around a puckered teneral area, whereas in such related forms as *fuscicauda* and *setiformis* these sclerites are blackish and subshining in contrast to the drab grayish color of abdomen, and there are numerous accessory bristles on the basal sclerite of hypopygium. In the female of *duplicata* and *longimana* the fore tarsal segments are not broader than those of mid tarsus. I have contrived to find characters that would separate *duplicata* from *longimana* effectively, but the results have not been entirely satisfactory owing to the variable nature of the species. In nearly all specimens of *duplicata* that I have seen the fore tibia has a robust apical posterodorsal bristle and there is usually at least a trace of clouding along cross veins, and in the male there is invariably present a bristle near base of anteroventral surface of mid femur, whereas in *longimana* these characters are seldom present or but weakly developed. The related forms *cresca* and *tarsata* may be readily distinguished from *duplicata* and *longimana* by the entirely yellow second antennal segment in the former species.

ALBERTA: 1 ♂, Edmonton, July 27 1936, (E. H. Strickland), [Univ. Alberta]. BRITISH COLUMBIA: 1 ♀, Keremeos, July 31 1923, (C. B. D. Garrett), [C. N. C.]. CALIFORNIA: 1 ♂, Yosemite Valley, May 22 1908, *type* of *duplicata* Mall., [A. N. S. P.]. 1 ♂, 1 ♀, Berkeley Hills, Alameda County, April 20 1908, *paratypes* of *duplicata* Mall., [Ill. N. H. S.]. 1 ♂, Pasadena, April 2 1929, (F. Grinnell Jr.); 1 ♂, 1 ♀, Mill Creek Canyon, San Bernardino Mts., June 9 1924, (J. M. Aldrich), [U. S. N. M.]. 1 ♂, Downey, November 27 1933; 2 ♀, Forest Home, San Bernardino County, Falls, November 21 1935, (A. J. Basinger), [A. J. Basinger]. 1 ♂, Amona, San Diego County, August 15 1914; 5 ♀, Cuyamaca Mountains, San Diego County, August 16 1914, (J. C. Bradley), [C. U.]. 1 ♂, 1 ♀, Berkeley, March 26 1897; 1 ♂, Palo Alto, April 27 1906; 1 ♂, Stanford University, February

28 1906, *cotypes* of *fuscinervis* Stein, [Z. M. U. B.]. 1 ♂, Giant Forest, Sequoia National Forest, August 22 1917, (R. C. Shannon), [H. C. H.]. 1 ♂, Elmonte, February 17 1935, (M. W. Stone), [J. Wilcox]. 1 ♂, Santa Cruz, April 19 1937, (R. Latta).

OREGON: 1 ♂, Talent, September 30 1916, (C. A. McCormick); 1 ♀, Vale, August 15 1902. 1 ♀, Salem, August 1923, (J. Wilcox), [Ore. State Col.]. 1 ♀, 4 miles south of Canyonville, Douglas County, May 4 1936, (Geo. Ferguson).

SOUTH DAKOTA: 1 ♂, 1 ♀, Spearfish, July 29 1924, (H. C. Severin), [South Dakota State Col.].

UTAH: 1 ♀, Provo, no date, (D. E. Johnson). 1 ♀, North Beaver, May 3 1934, (G. F. Knowlton), [Utah Agr. Col.].

WASHINGTON: 2 ♂, North Dryden, April 23 1925; 1 ♂, Pullman, April 24 1924, (A. L. Melander), [A. L. M.].

WYOMING: 1 ♂, Yellowstone Park, Crescent Hill, July 5 1923; 1 ♀, Yellowstone Park, Beach Springs, July 19 1923; 1 ♀, Yellowstone Park, Thumb Station, July 16 1923; 1 ♀, Yellowstone Park, Apollinaris, July 8 1923, (A. L. Melander), [A. L. M.].

Pegomyia longimana (Pokorny) (Figs. 17, 44, 77.)

Chortophila longimana Pokorny, Verh. zool.-bot. Ges. Wien, XXXVII, p. 405, 1887.
Pegomyia longimana Stein, Wien. Ent. Zeitg., XXV, p. 96, 1906. Stein, Arch. f. Naturgesch., (1913), LXXIX, (A), hft. 8, p. 35, 1914. Stein, Arch. f. Naturgesch., (1915), LXXXI, (A), hft. 10, p. 124, 1916. Ringdahl, Trømso Museums Årshefter, (1926), XLIX, nr. 3, p. 34, 1928. Karl, Tierwelt Deutschlands, XIII, pt. 3, p. 135, 1928. Ringdahl, K. Svensk. Vet. Kap. Akad. Skrift. Naturskyddsärenden, nr. 18, p. 21, 1931. Tiensuu, Acta Soc. Faun. Flor. Fennica, LVIII, no. 4, p. 28, 1935. Séguy, Gen. Insect., fasc. 205, p. 59, 1937.
Pegomyia (*Pegomyza*) *longimana* Ringdahl, Ent. Tidskr., LIX, hft. 3–4, p. 195, 1938.

I am of the opinion that the specimens listed below are referable to this european species, the male from Quebec being typical as indicated by the slender proportions of abdomen, legs and wings. In the specimens from the western States these parts are comparatively broader and more robust. In addition there is a tendency for the bristles on anteroventral surface of hind femur to be continued in series to near base, whereas in Quebec specimen the bristles on anteroventral surface are largely confined to distal half.

The species *longimana* is closely related to *duplicata*, from which it may invariably be distinguished by the absence of a robust bristle at apex of posterodorsal surface of fore tibia. Further differences and affinities between the species are discussed under *duplicata*.

ALBERTA: 9 ♂, Waterton, July 17 1923, (H. L. Seamans), [C. N. C.]. 1 ♂, Edmonton, June 2 1936, (E. H. Strickland), [Univ. Alberta].

CALIFORNIA: 1 ♂, Tuolumne Meadows, 8600 ft. alt., August 15 1916, (G. R. Pilate).

COLORADO: 1 ♂, Pingree Park, August 24 1923, (R. C. Smith), [H. C. H.].

IDAHO: 1 ♂, Potlatch, May 28 1930, (J. M. Aldrich), [U. S. N. M.].

QUEBEC: 1 ♂, Bonne Ésperance, July 14 1929, (W. J. Brown), [C. N. C.].

SOUTH DAKOTA: 1 ♀, Spearfish, July 26 1924; 1 ♀, Cutler, July 19 1924, [South Dakota State Col.].

UTAH: 1 ♂, Spanish Fork, May 21 1938, (G. F. Knowlton), [Utah Agr. Col.].

WASHINGTON: 3 ♂, Mount Rainier, White River, July 23 1924; 1 ♂, Mount Rainier, Summerland, July 24 1924; 1 ♂, Mount Rainier, Yakima Park, July 22 1924, (A. L. Melander), [A. L. M.].

WYOMING: 1 ♂, Yellowstone Park, Beach Springs, July 19 1923; 1 ♀, Yellowstone Park, Clematis Creek, July 9 1923, (A. L. Melander), [A. L. M.].

Pegomyia solitaria Stein

Pegomyia solitaria Stein, Wien. Ent. Zeitg., XXV, p. 80, 1906. Stein, Arch. f. Naturgesch., (1913), LXXIX, (A), hft. 8, p. 36, 1914 . Stein, Arch. f. Naturgesch., (1915), LXXXI, (A), hft. 10, p. 125, 1916. Karl, Tierwelt Deutschlands, XIII, pt. 3, p. 140, 1928. Ringdahl, Arkiv. Zool., XXI, (A), no. 20, p. 5, 1930. Tiensuu, Acta Soc. Faun. Flor. Fennica, LVIII, no. 4, p. 28, 1935. Séguy, Gen. Insect., fasc. 205, p. 63, 1937.

Pegomyia (*Pegomyia*) *solitaria* Ringdahl, Ent. Tidskr., LIX, hft. 3–4, p. 208, 1938.

The species *solitaria* may be readily recognized owing to the unusual bristling of the hind tibiae. The true posterodorsal and apical mid dorsal bristles are absent and the dorsal surface has a bristle at middle. In general habitus the species may be linked to the *intersecta*-subgroup. The processes in male appear as weakly chitinized lamellate appendages, which are bare except for a fringe of setulae along the greater part of inner border and a few bristles at extreme base on outer border. In the female the caudal margin of last segment of ovipositor has a series of stiff short bristles.

ALASKA: 4 ♂, Savonoski, Naknek Lake, July 1919, (J. S. Hine), [Ohio State Univ.].

ALBERTA: 1 ♀, Banff, August 12 1922, (C. B. D. Garrett), [C. N. C.].

BRITISH COLUMBIA: 1 ♀, Agassiz, May 1 1924, (R. Glendenning), [C. N. C.].

IDAHO: 1 ♀, Moscow Mountain, August 26 1923, (A. L. Melander), [A. L. M.].

MONTANA: 1 ♀, Yellowstone National Park, August 25 1915, 8200 ft. alt., [Mont. Exp. Sta.]. 1 ♀, Gallatin County, August 15 1912, 5400 ft. alt.

QUEBEC: 1 ♀, Hemmingford, October 15 1924; 1 ♀, "K. Camns," August 26 1931, (W. A. Reeks), [C. N. C.].

Pegomyia abnormis Stein

Pegomyia abnormis Stein, Arch. f. Naturgesch., (1918), LXXXIV, (A), hft. 9, p. 65, 1920. Séguy, Gen. Insect., fasc. 205, p. 51, 1937.

I have only been able to recognize this species from specimens belonging to the original series, which was collected on Moscow Mt., Idaho. The male has the vertex of head and parafrontals bristled like the female, the interfrontalia is uniformly wide throughout, being nearly equal in width to breadth of third antennal segment. In both male and female the humeral callosities, scutellum, thoracic pleura and caudal segments of abdomen are yellowish testaceous, and the apical setulae of scutellum are hair-like as those on ventral surface. Usually there are one or more hairs to be found on caudal surface of hind coxae proximad, and the costa is devoid of setulae on lower surface.

The processes in male resemble those of *dissecta*, the inner border being densely clothed with short setulae from base to near apex. In the female the terminal sclerites of ovipositor are armed with stiff black setae, the cruciate bristles are robust, and ventral bristle of caudal pair of sternopleurals is weakly developed.

IDAHO: 1 ♀, Moscow Mountain, August 23 1908; 1 ♀, July 22 1911, *cotypes;* 1 ♂, 1 ♀, no data, [U. S. N. M.]. 3 ♂, same locality, July 22 1911, *cotypes*, [A. L. M.].

Pegomyia unguiculata Malloch (Figs. 3, 32, 56.)

Pegomyia unguiculata Malloch, Trans. Amer. Ent. Soc., XLVI, p. 176, 1920. Malloch, Bull. Brooklyn Ent. Soc., XV, p. 122, 1920. Frison, Bull. Ill. Nat. Hist. Surv., XVI, p. 206, 1927.

Pogonomyia unguiculata Séguy, Gen. Insect., fasc. 205, p. 320, 1937.

The species *unguiculata* has much in common with *intersecta* (Meigen) and *tacta* Huckett. In the male this is notably apparent owing to the peculiar structure and appearance of the hypopygium and copulatory appendages, the former being shiny and the processes lamellate and horny, largely devoid of bristles. In *intersecta* the abdomen and tibiae are black, in *unguiculata* the abdomen is blackish and the tibiae yellow, whilst in *tacta* the abdomen and tibiae are reddish.

ALASKA: 3 ♂, Camp 327, "Alaska Eng. Comm.," July 13 1921, (J. M. Aldrich), [U. S. N. M.].

ALBERTA: 1 ♂, Lake Louise, July 15 1908, (C. S. Minot), *paratype*, [A. N. S. P.]. 24 ♂, Lake Louise, July 27 1917, [Muséum National d'Histoire Naturelle]. 1 ♀, Banff, August 7 1922, (C. B. D. Garrett), [C. N. C.].

BRITISH COLUMBIA: 1 ♀, Similkameen, July 24 1906, (Sherman).

Pegomyia pilosa Stein (Figs. 29, 49, 65.)

Pegomyia pilosa Stein, Ent. Nachr., XXVI, p. 322, 1900. Stein, Wien. Ent. Zeitg., XXV, p. 82, 1906. Stein, Arch. f. Naturgesch., (1913), LXXIX, (A), hft. 8, p. 36, 1914. Stein, Arch. f. Naturgesch., (1915), LXXXI, (A), hft. 10, p. 126, 1916. Ringdahl, Trømso Museums Årshefter, XLIX, (1926), no. 3, p. 33, 1928. Ringdahl, K. Svensk. Vet. Kap. Akad. Skrift. Naturskyddsärenden, nr. 18, p. 21, 1931. Tiensuu, Acta Soc. Faun. Flor. Fennica, LVIII, no. 4, p. 29, 1935. Séguy, Gen. Insect., fasc. 205, p. 61, 1937.

Pegomyia flavipes Malloch (not Fallén), Rept. Canad. Arct. Exped., 1913–18, III, pt. C, p. 74C, 1919. Séguy, Gen. Insect., fasc. 205, p. 55, 1937.

Pegomyia (*Pegomyia*) *pilosa* Ringdahl, Ent. Tidskr., LIX, hft. 3–4, p. 208, 1938.

The specimens of *pilosa* before me exhibit a marked degree of variation in color in both sexes. The male specimens from Nova Scotia have a paler aspect, in which the palpi, second antennal segments and humeral callosities are entirely yellowish; the male from Bar Harbor, Maine, is darker and has the second antennal segment rufous and the palpi fuscous at apex; the males from Mount Rainier and Alaska have the antennae nearly entirely black, in the former case the palpi are considerably infuscated. All male specimens have the characteristic development of the chaetotaxy on hind femora and hind tibiae, although in specimens from Bar Harbor and Mount Monadnock this peculiarity is not so sharply exhibited as in Nova Scotian and Alaskan specimens. In addition all femora are broadly infuscated on dorsum towards the apical region and hairs and bristles on ventral region of occiput are golden tinged, less so in the darker forms and more highly so in paler specimens. It is not improbable that males of this species which have the hind femoral bristles and hind tibial setulae more normally developed may be mistaken for those of the related form *Pegomyia tenera obscurior* Collin.[36] Such specimens of *pilosa* may

[36] Collin, J. E. The Oxford University Expedition to Greenland, 1928. Diptera (Orthorrhapha Brachycera and Cyclorrhapha) from Greenland. *Ann. Mag. Nat. Hist.*, ser. 10, VII pp. 84–85, 1931.

be recognized more surely by the abnormally long bristles in the posterior series of fore femur.

The female specimen from Machias has the mesonotum considerably darkened except on scutellum and humeral callosities, and the frontal vitta is blackened on caudal half, whereas in the remaining female specimens the thorax is largely yellowish, being slightly grayish tinged on dorsum, and the frontal vitta is entirely reddish. The palpi in the Machias specimen are nearly entirely reddish, whereas in the remaining specimens they are rather decidedly infuscated apicad. The ovipositor is compressed, strongly chitinized, and seems fitted for piercing. The marginal bristles of fifth abdominal sternum are robustly developed.

The female of *pilosa* is difficult to distinguish from those of *rufipes* and *tenera*, all having the palpi infuscated at apex and the presutural series of acrostical bristles not widely separated from one another. In cases where female specimens of *pilosa* have yellow palpi, the species approaches the characters defining the female of *flavipalpis*. From the female of these three species that of *pilosa* may usually be distinguished by having the proximal half of anteroventral surface of hind femur bare, three bristles on anterodorsal surface of hind tibia and no cruciate bristles.

I have reexamined the specimens from Alaska which have been recorded by Malloch[37] as *flavipes*, and am of the opinion that they belong to the species *pilosa*, resembling in every important respect the specimens from Nova Scotia. Thus *flavipes* (Fallén) so far as I know has yet to be correctly recorded as occurring in North America.

ALASKA: 1 ♂, Bering Sea, July 1913; 1 ♂, Nome, August 21 1916, (F. Johansen), [C. N. C.].

MAINE: 1 ♂, Salisbury Cove, July 24 1925; 1 ♂, Seal Harbor, July 29 1930, (A. L. Melander), [A. L. M.]. 1 ♀, Machias, July 1922. 1 ♂, Bar Harbor, June 15 1921.

NEW HAMPSHIRE: 1 ♀, Mount Monadnock, July 26 1926, (A. L. Melander), [A. L. M.].

NOVA SCOTIA: 1 ♂, Truro, July 13 1913, (R. Matheson); 2 ♂, Kentville, July 13 1924, (R. P. Gorham), [C. N. C.].

[37] Malloch, J. R. The Diptera collected by the Canadian Expedition, 1913–18 (excluding the Tipulidae and Culicidae). *Rep. Can. Arctic Exped.*, 1913–18, III, Ins., pt. C., p. 74C, 1919.

ONTARIO: 1 ♀, Sand Lake, July 1 1926, (F. P. Ide), [C. N. C.].
QUEBEC: 1 ♀, Abbotsford, June 9 1936, (G. E. Shewell), [C. N. C.].
WASHINGTON: 1 ♂, Mount Rainier, Summerland Trail, July 24 1924; 2 ♀, Mount Rainier, White River, July 23 1924, (A. L. Melander), [A. L. M.].

Pegomyia unicolor Stein (Figs. 27, 51, 67.)

Pegomyia unicolor Stein, Berl. Ent. Zeitschr., (1897), XLII, p. 236, 1898. Aldrich, Misc. Coll. Smithsn. Inst., XLVI, no. 1444, p. 558, 1907. Smith, Ann. Rept. N. J. State Museum 1909, p. 792, 1910. Stein, Arch. f. Naturgesch., (1917), LXXXIII, (A), hft. 1, p. 149, 1919. Stein, Arch. f. Naturgesch., (1918), LXXXIV, (A), hft. 9, p. 63, 1920. Malloch, Bull. Brooklyn Ent. Soc., XV, p. 122, 1920. Huckett, Ann. Ent. Soc. Amer., XIV, p. 315, 1921. Huckett, Mem. 77, N. Y. (Cornell) Agr. Exp. Station, (1923), p. 47, 1924. Johnson, Occ. Pap. Boston Soc. Nat. Hist., VII, p. 233, 1925. Huckett, Mem. 101, N. Y. (Cornell) Agr. Exp. Station, (1926), p. 841, 1928. Séguy, Gen. Insect., fasc. 205, p. 65, 1937.
Pogonomyia unicolor Séguy, Gen. Insect., fasc. 205, p. 320, 1937.

The species *unicolor* may be readily distinguished by its entirely yellowish antennae (frequently in female specimens the third antennal segment may appear tinged with fuscous), the yellowish setulae on humeral callosities, sternopleura, coxae and ventral region of occiput, the widely protruded lower calyptral scale and widely separated series of acrostical bristles. The species *geniculata* is of similar habitus, but the setulae are black and the calyptral scales are subequal.

ILLINOIS: 2 ♂, 1 ♀, no data. [Ill. N. H. S.].
MICHIGAN: 1 ♂, East Lansing, May 24 1937, (C. W. Sabrosky), [Mich. State Col.].
NEW YORK: 1 ♂, McLean, June 20 1904. 1 ♂, 1 ♀, Trenton Falls, June 5–8 1921, (Leonard & Forbes). 1 ♂, Ithaca, July. 1 ♀, Little Neck, Long Island, July 2 1921, [H. C. H.]. 1 ♂, Oswego, June 11 1897, [U. S. N. M.].
OHIO: 2 ♂, 2 ♀, Ira, no date, (J. S. Hine), [Ohio State Univ.].
OKLAHOMA: 1 ♂, 1 ♀, Broken Bow, June 17 1934, (J. Stankavitch), [Okla. Agr. & Mech. Col.].
ONTARIO: 1 ♀, Miners Bay, May 26 1931, (G. S. Walley), [C. N. C.].
PENNSYLVANIA: 1 ♂, Natrona, August 1 1895; 1 ♀, same locality, July 13 1895, *cotypes*, [Field Museum]. 1 ♂, Castle Rock, June 9 1907, [U. S. N. M.].
WISCONSIN: 1 ♀, Madison, May 21 1930, (R. Bushnell), [Univ. Wisc.].

Pegomyia rufina (Fallén)

Musca rufina Fallén, Muscides, p. 92, 1825.
Anthomyza nigriceps Zetterstedt, Dipt. Scand., XIV, p. 6300, 1860.

Pegomyia nigriceps Stein, Wien. Ent. Zeitg., XXI, hft. 2–3, p. 51, 1902.
Pegomyia squamifera Stein, Wien. Ent. Zeitg., XXV, p. 63, 1906. Stein, Arch. f. Naturgesch., (1913), LXXIX, (A), hft. 8, p. 35, 1914. Stein, Arch. f. Naturgesch., (1915), LXXXI, (A), hft. 10, p. 125, 1916. Stein, Arch. f. Naturgesch., (1918) LXXXIV, (A), hft. 9, p. 72, 1920. Karl, Tierwelt Deutschlands, XIII, pt. 3, p. 137, 1928. Séguy, Gen. Insect., fasc. 205, p. 64, 1937.
Pegomyia rufina Stein, Wien. Ent. Zeitg., XXV, p. 64, 1906. Stein, Arch. f. Naturgesch., (1913), LXXIX, (A), hft. 8, p. 35, 1914. Stein, Arch. f. Naturgesch., (1915), LXXXI, (A), hft. 10, p. 125, 1916. Karl, Tierwelt Deutschlands, XIII, (3), p. 138, 1928. Tiensuu, Acta Soc. Faun. Flor. Fennica, LVIII, no. 4, p. 28, 1935. Séguy, Gen. Insect., fasc. 205, p. 64, 1937.
Pegomyia (*Pegomyia*) *rufina* Séguy, Faune de France, VI, p. 163, 1923. Ringdahl, Ent. Tidskr., LIX, hft. 3–4, p. 202, 1938.
Pegomyia (*Pegomyia*) *squamifera* Séguy, Faune de France, VI, p. 165, 1923.

My knowledge of the species is based largely on a male specimen collected in Sweden by Mr. Ringdahl, to which he had given the name *squamifera* Stein. Recently Ringdahl has considered *squamifera* a synonym of *rufina* (Fallén). Under the name *squamifera* Stein (1920) has recorded the species as occurring in Colorado from material in the Vienna Museum. The species superficially resembles *winthemi*, from which it differs by having the scutellum and antennae entirely black and palpi fuscous.

Pegomyia mallochi Huckett

Pegomyia mallochi Huckett, Trans. Amer. Ent. Soc., LXV, p. 15, 1939.
Pegomyia winthemi Malloch (not Meigen), Trans. Amer. Ent. Soc., XLVI, p. 178, 1920. Malloch, Bull. Brooklyn Ent. Soc., XV, p. 122, 1920. Huckett, Mem. 77, N. Y. (Cornell) Agr. Exp. Station, (1923), p. 48, 1924. Johnson, Occ. Pap. Boston Soc. Nat. Hist., VII, p. 233, 1925. Johnson, Insect Fauna, Biol. Surv. Mt. Desert Region, p. 210, 1927. Huckett, Mem. 101, N. Y. (Cornell) Agr. Exp. Station, (1926), p. 841, 1928.

The species *mallochi* as indicated by the above synonymy has been confused recently with the european species *winthemi* (Meigen). The species *mallochi* may be distinguished from *winthemi* by having the palpi fuscous, thorax bare where normally the lower posthumeral bristle is situated, and scutellum largely devoid of setulae on disc. The females of *mallochi* and *winthemi* have the distal segments of mid and hind tarsi discoid in appearance, but *mallochi* in addition to the above distinguishing characters has no cruciate bristles.

District of Columbia: 1 ♀, Rock Creek Park, August 12 1923, [U. S. N. M.].

Massachusetts: 1 ♂, Petersham, July 1926, (A. L. Melander), [A. L. M.].

New Hampshire: 1 ♂, Franconia: July 18 1915, (C. H. T. Townsend), [U. S. N. M.].

New Jersey: 2 ♂, Lakehurst, June 26 1931, (A. L. Melander), [A. L. M.]. 1 ♀, Trenton, July 25, [A. N. S. P.].

New York: 1 ♂, Ithaca, July 16 1903; 1 ♀, 6-mile Creek, Ithaca, August 4 1921. 1 ♀, Ringwood, near Ithaca, June 26 1920; 1 ♀, Taughanic Falls, August 14 1928. 1 ♂, Dix Hills, Long Island, June 15 1935, (F. S. Blanton); 1 ♀, Harmon, July 5 1926; 1 ♀, Yaphank, Long Island, June 6 1928; 1 ♂, Selden, Long Island, May 30 1930; 1 ♀, Southampton, Long Island, July 15 1923; 1 ♀, Long Pond, Wading River, Long Island, June 30 1924; 1 ♂, Orient, Long Island, June 20 1936, [H. C. H.]. 1 ♂, Riverhead, Long Island, July 11 1926; 1 ♀, same locality, August 10 1927, *type* and *allotype*, [A. N. S. P.].

Oklahoma: 2 ♂, Broken Bow, June 19 1934, (J. Stankavitch), [Okla. A. & M. Col.].

Pennsylvania: 1 ♂, Ohio Pyle, August 8 1905, [Carnegie Museum]. 1 ♂, Roxborough, Philadelphia, June 20, [A. N. S. P.].

Texas: 3 ♀, College Station, July, [Texas A. & M. Col.].

Virginia: 1 ♀, Chain Bridge, June 23 1923, [U. S. N. M.].

West Virginia: 3 ♀, Cheat Mountains, (H. H. Smith), [Carnegie Museum].

Pegomyia winthemi (Meigen)

Anthomyia winthemi Meigen, Syst. Beschr., v, p. 186, 1826.

Anthomyza winthemi Zetterstedt, Dipt. Scand., v, p. 1792, 1846.

Anthomyia latitarsis Schiner, Fauna Austr., i, p. 635, 1862. Neuhaus, Diptera Marchica, p. 226, 1886. Stein, Ent. Nachr., xiv, p. 375, 1888. Slosson, Ent. News, viii, p. 237, 1897. Aldrich, Misc. Coll. Smithsn. Inst., xlvi, no. 1444, p. 558, 1905.

Anthomyia (*Pegomyia*) *latitarsis* Strobl, Verh. zool.-bot. Ges. Wien, xliii, p. 251, 1893.

Pegomyia winthemi Stein, Wien. Ent. Zeitg., xxv, p. 61, 1906. Schnabl, Hor. Soc. Ent. Ross., xxxix, p. 8, 1910. Schnabl, Deutsch. Entom. Zeitschr., hft. 6, p. 81, 1911. Stein, Arch. f. Naturgesch., (1913), lxxix, (A), hft. 8, p. 33, 1914. Stein, Arch. f. Naturgesch., (1915), lxxxi, (A), hft. 10 p. 127, 1916. Stein, Arch. f. Naturgesch., (1918), lxxxiv, (A), hft. 9, p. 72, 1920. Britton, Bull. 31, Conn. Geol. Nat. Hist. Surv., p. 199, 1920. Ringdahl, Trømso Museums Årshefter, (1926), xlix, nr. 3, p. 33, 1928. Karl, Tierwelt Deutschlands, xiii, pt. 3, p. 123, 1928. Tiensuu, Acta Soc. Faun. Flor. Fennica, lviii, no. 4, p. 30, 1935. Séguy, Gen. Insect., fasc. 205, p. 66, 1937.

Pegomyia (*Pegomyia*) *winthemi* Schnabl and Dziedzicki, Abh. K. Leop.-Carol. Deutsch. Akad. Naturforsch., xcv, nr. 2, p. 112, 1911. Séguy, Faune de France, vi, p. 166, 1923. Ringdahl, Ent. Tidskr., lix, hft. 3–4, p. 202, 1938.

Pegomyia fuscofasciata Malloch, Trans. Amer. Ent. Soc., xlvi, p. 178, 1920. Malloch, Bull. Brooklyn Ent. Soc., xv, p. 123, 1920. Huckett, Mem. 77, N. Y.

(Cornell) Agr. Exp. Station, (1923), p. 44, 1924. Johnson, Occ. Pap. Boston Soc. Nat. Hist., VII, p. 232, 1925. Hallock and Parker, Circ. 103, N. J. Dept. Agr., p. 17, 1926. Johnson, Insect Fauna, Biol. Surv. Mt. Desert Region, p. 209, 1927. Frison, Bull. Ill. Nat. Hist. Surv., XVI, p. 206, 1927. Huckett, Mem. 101, N. Y. (Cornell) Agr. Exp. Station, (1926), p. 840, 1928. Johnson, Psyche, XXXVI, p. 143, 1929.

Pogonomyia fuscofasciata Séguy, Gen. Insect., fasc. 205, p. 319, 1937.

The species *winthemi* has yellow palpi, numerous setulae on disc of scutellum, duplicated posthumeral bristle, and in the female cruciate bristles are well developed and distal segments of mid and hind tarsi discoid in appearance. The species has recently been recorded in North American literature as *fuscofasciata* Malloch, with which it is identical.

ALASKA: 3 ♂, Hurricane, July 15 1921, (J. M. Aldrich), [U. S. N. M.].

BRITISH COLUMBIA: 1 ♂, Victoria, May 3 1919, (W. B. Anderson), [C. N. C.].

MAINE: 1 ♀, Seal Harbor, July 29 1930, (A. L. Melander), [A. L. M.].

MANITOBA: 1 ♂, Victoria Beach, July 8–9 1928, (N. Criddle), [C. N. C.].

MASSACHUSETTS: 1 ♂, Petersham, July 1926, (A. L. Melander), [A. L. M.].

NEW HAMPSHIRE: 1 ♀, Franconia, July 20 1915, (C. H. T. Townsend), [U. S. N. M.]. 1 ♀, Alpine Garden, Mount Washington, July 11 1931, (A. L. Melander), [A. L. M.].

NEW JERSEY: 1 ♂, Lakehurst, May 29 1927, (A. L. Melander), [A. L. M.].

NEW YORK: 1 ♀, Wilmington Notch, Adirondacks, July 2 1922, (J. M. Aldrich); 1 ♂, Whiteface Mountain, Adirondacks, July 4 1922, 3300 ft. alt., [U. S. N. M.]. 1 ♀, Pearl Point, Lake George, August 21 1920; 1 ♀, Juanita Island, Lake George, August 29 1920, (M. D. Leonard); 1 ♂, Taughanic Falls, near Ithaca, August 14 1928; 1 ♀, Ringwood, near Ithaca, June 26 1920; 2 ♂, Bear Mountain, April 23 1936, (F. S. Blanton); 1 ♀, Babylon, Long Island, July 7 1933; 1 ♂, Islip, Long Island, July 4 1933; 1 ♀, Yaphank, Long Island, August 8 1926; 3 ♂, Southold, Long Island, June 13 1926; 1 ♂, Selden, Long Island, May 30 1930; 7 ♂, Riverhead, Long Island, June 26 1927, (H. C. Huckett), [H. C. H.].

ONTARIO: 1 ♀, Mer Bleue, June 22 1916; 1 ♀, Fewagami Forest Reserve, no date, [H. C. H.].

QUEBEC: 1 ♂, Abbotsford, August 30 1936, (G. E. Shewell); 1 ♂, Covey Hill, June 15 1927, (W. J. Brown), [C. N. C.].

VERMONT: 1 ♂, Mount Equinox, July 15 1935, (F. S. Blanton), [H. C. H.].

WASHINGTON: 1 ♀, Mount Rainier, August 14 1931; 1 ♀, Stabler, July 3 1926, (K. Gray), [H. C. H.].

WISCONSIN: 1 ♀, Dane County, August 6 1936, (F. M. Snyder), [Univ. Wisc.].

Pegomyia vittigera (Zetterstedt)

Anthomyza vittigera Zetterstedt, Ins. Lapponica, p. 697, 1838. Siebke, Enum. Insect. Norveg., IV, p. 128, 1877.

Anthomyia vittigera Schiner, Faun. Austr., I, p. 641, 1862.

Pegomyia vittigera Stein, Wien. Ent. Zeitg., XXV, p. 68, 1906. Stein, Arch. f. Naturgesch., (1913), LXXIX, (A), hft. 8, p. 34, 1914. Stein, Arch. f. Naturgesch. (1915), LXXXI, (A), hft. 10, p. 127, 1916. Britton, Bull. 31, Conn. Geol. Nat. Hist. Surv., p. 199, 1920. Malloch, Bull. Brooklyn Ent. Soc., XV, p. 123, 1920. Johnson, Occ. Pap. Boston Soc. Nat. Hist., VII, p. 233, 1925. Johnson, Insect Fauna, Biol. Surv. Mt. Desert Region, p. 210, 1927. Ringdahl, Trømso Museums Årshefter, (1926), XLIX, no. 3, p. 33, 1928. Huckett, Mem. 101, N. Y. (Cornell) Agr. Exp. Station, (1926), p. 841, 1928. Karl, Tierwelt Deutschlands, XIII, pt. 3, p. 128, 1928. Ringdahl, Arkiv. Zool., XXI, (A), no. 20, p. 5, 1930. Curran, Bull. Amer. Mus. Nat. Hist., LXI, p. 85, 1930. Ringdahl, K. Svensk. Veten. Kap. Akad. Skrift. Naturskyddsarenden, nr. 18, p. 21, 1931. Tiensuu, Acta Soc. Faun. Flor. Fennica, LVIII, no. 4, p. 29, 1935. Séguy, Gen. Insect., fasc. 205, p. 66, 1937.

Pegomyia (*Pegomyia*) *vittigera* Séguy, Faune de France, VI, p. 166, 1923, Ringdahl, Ent. Tidskr., LIX, hft. 3–4, p. 204, 1938.

The species *vittigera* resembles *gilva* Zetterstedt in that the thorax is largely yellowish and the series of presutural acrostical bristles are slightly closer to one another than to their respective series of dorsocentral bristles. In *vittigera* the mesonotum and to a lesser extent abdominal terga are slightly more shiny than in *gilva*, approaching in character the glossy nature of proboscis, and the ocellar triangle is shining. In the male of *vittigera* the mid anterodorsal bristle of mid tibia is more robust and prealar bristle slightly longer than in *gilva*. In the female of *vittigera* the fore femur has no comparatively stronger bristle developed apicad among the posterior median series, as is invariably present in *gilva*.

ALBERTA: 1 ♀, Nordegg, July 5 1921, (J. McDunnough), [C. N. C.]. 1 ♀, Edmonton, August 18 1936, (E. H. Strickland), [Univ. Alberta].

BRITISH COLUMBIA: 2 ♀, Carbonate to Columbia River, July 7–12 1908, 2600 ft. alt., (J. C. Bradley), [C. U.]. 1 ♀, Saint Mary's, July 12 1926, (A. A. Dennys), [C. N. C.].

NEW HAMPSHIRE: 1 ♀, Benton, July 6 1931; 1 ♀, Dolly Copp, White Mountains, July 13 1931, (A. L. Melander), [A. L. M.].

NEW YORK: 1 ♀, Avalanche Trail, Adirondacks, July 30 1929, (A. L. Melander), [A. L. M.].

NOVA SCOTIA: 1 ♀, Truro, July 13 1913, (R. Matheson), [H. C. H.].

ONTARIO: 1 ♀, Orillia, June 26 1926, (C. H. Curran), [C. N. C.].

QUEBEC: 1 ♀, Ile de Montreal, July 14 1906, (Beaulieu), [C. N. C.]. 1 ♀, Montreal, August 8 1930, (A. L. Melander), [A. L. M.].

Pegomyia gilva (Zetterstedt)

Anthomyza gilva Zetterstedt, Dipt. Scand., v, p. 1789, 1846. Siebke, Enum. Insect. Norveg., IV, p. 128, 1877.

Pegomyia gilva Stein, Wien. Ent. Zeitg., XXV, p. 69, 1906. Stein, Arch. f. Naturgesch., (1913), LXXIX, (A), hft. 8, p. 34, 1914. Stein, Arch. f. Naturgesch., (1915), LXXXI, (A), hft. 10, p. 127, 1916. Stein, Arch. f. Naturgesch., (1918), LXXXIV, (A), hft. 9, p. 72, 1920. Ringdahl, Trømso Museums Årshefter, (1926), XLIX, no. 3, p. 34, 1928. Karl, Tierwelt Deutschlands, XIII, pt. 3, p. 129, 1928. Ringdahl, K. Svensk. Veten. Kap. Akad. Skrift, Naturskyddsärenden, nr. 18, p. 21, 1931. Tiensuu, Acta Soc. Faun. Flor. Fennica, LVIII, no. 4, p. 29, 1935. Séguy, Gen. Insect., fasc. 205, p. 56, 1937.

Pegomyia pallida Stein, Wien. Ent. Zeitg., XXV, p. 69, 1906. Stein, Arch. f. Naturgesch., (1913), LXXIX, (A), hft. 8, p. 34, 1914. Stein, Arch. f. Naturgesch., (1915), LXXXI, (A), hft. 10, p. 127, 1916. Karl, Tierwelt Deutschlands, XIII, pt. 3, p. 128, 1928. Tiensuu, Acta Soc. Faun. Flor. Fennica, LVIII, no. 4, p. 29, 1935. Séguy, Gen. Insect., fasc. 205, p. 61, 1937.

Pegomyia luteola Malloch, Trans. Amer. Ent. Soc., XLVI, p. 175, 1920. Malloch, Bull. Brooklyn Ent. Soc., XV, p. 122, 1920. Huckett, Mem. 77, N. Y. (Cornell) Agr. Exp. Station, (1923), p. 46, 1924. Johnson, Occ. Pap. Boston Soc. Nat. Hist., VII, p. 232, 1925. Johnson, Insect Fauna, Biol. Surv. Mt. Desert Region, p. 210, 1927. Huckett, Mem. 101, N. Y. (Cornell) Agr. Exp. Station, (1926), p. 840, 1928. Curran, Bull. Amer. Mus. Nat. Hist., LXI, p. 85, 1930.

Pogonomyia luteola Séguy, Gen. Insect., fasc. 205, p. 319, 1937.

Pegomyia (*Pegomyia*) *gilva* Ringdahl, Ent. Tidskr., LIX, hft. 3–4, p. 204, 1938.

I have tentatively come to the conclusion that *gilva* (Zetterstedt), *pallida* Stein and *luteola* Malloch represent the same species. Nearly all of the North American specimens that I have seen are typical of *pallida*, with the important exception that there is no consistency in the coloring of the occipital setulae. These setae may be yellowish or blackish, or some yellowish and some blackish. According to Stein (1906) (1914) (1916) and Karl (1928) *gilva* may be partly distinguished from *pallida* by the possession of a longer prealar bristle. The few european specimens that I have seen possessing such a character and named *gilva* were, in my opinion, representative of *vittigera*.

There is in the North American specimens of *gilva* a considerable variation in the extent of infuscation on thorax, abdomen and femora. The abdomen in both sexes may or may not have a blackish incisure across caudal margins of terga, and femora may or may not have a fuscous apical spot. In the female of *pallida*

the fore femur has a comparatively stronger bristle developed apicad among the posterior median series of bristles, and the ocellar triangle is pruinescent, not shining as in *vittigera*.

In the study of this species I have received the generous aid and advice of Mr. Ringdahl and Mr. Tiensuu. Mr. Ringdahl in examining a representative series of North American specimens regarded them as belonging to *pallida* Stein, *gilva* (Zetterstedt) not being definitely known to him. Mr. Tiensuu has kindly provided me with Finnish specimens for comparative study.

ALBERTA: 1 ♀, Wabamun, July 1 1927, (E. H. Strickland), [Univ. Alberta].

BRITISH COLUMBIA: 1 ♀, Osogoos Valley, August 12 1920, (E. Hearle), [C. N. C.].

COLORADO: 1 ♀, Pingree Park, August 14 1934, (C. W. Sabrosky), [Mich. State Col.].

MAINE: 1 ♂, Eastport, July 14 1909, (C. W. Johnson), *type* of *luteola* Mall. [N. E. M. N. H.]. 1 ♀, Bar Harbor, July 21 1919; 1 ♀, Machias, July 1921, (C. W. Johnson).

MANITOBA: 1 ♀, Aweme, July 22 1922, (R. M. White), [C. N. C.].

MASSACHUSETTS: 1 ♂, Petersham, July 26 1926, (A. L. Melander), [A. L. M.].

NEW HAMPSHIRE: 1 ♂, Franconia, July 9 1915, (C. H. T. Townsend), [U. S. N. M.]. 2 ♂, Benton, July 6 1931, (A. L. Melander), [A. L. M.].

NEW JERSEY: 1 ♀, Trenton, June 13, [A. N. S. P.].

NEW YORK: 2 ♂, 1 ♀, Whiteface Mountain, Adirondacks, July 4 1922; 2 ♂, 1 ♀, Wilmington Notch, Adirondacks, July 2 1922, (J. M. Aldrich), [U. S. N. M.]. 1 ♂, Adirondacks, Avalanche Trail, July 30 1929, (A. L. Melander), [A. L. M.]. 1 ♀, Pearl Point, Lake George, August 31 1920; 2 ♀, Wild Flower Preserve, Slaterville, August 16 1928; 1 ♀, Ithaca, June (R. C. Shannon); 3 ♂, 1 ♀, Riverhead, Long Island, August 10 1927, [H. C. H.].

NOVA SCOTIA: 1 ♀, Kentville, July 9 1924, (R. P. Gorham), [C. N. C.].

ONTARIO: 1 ♀, Sand Lake, June 28 1926, (F. P. Ide), [Univ. Alberta].

PENNSYLVANIA: 1 ♂, Pocono Lake, July 10; 1 ♀, Glenside, June 15, [A. N. S. P.].

Pegomyia incisiva Stein (Figs. 28, 50, 64.)

Pegomyia incisiva Stein, Wien. Ent. Zeitg., XXV, p. 73, 1906. Stein, Arch. f. Naturgesch., (1915) LXXXI, (A), hft. 10, p. 127, 1916. Karl, Tierwelt Deutschlands, XIII, p. 126, 1928. Ringdahl, K. Svensk. Veten. Kap. Akad. Skrift. Naturskyddsärenden, nr. 18, p. 30, 1931. Tiensuu, Acta Soc. Faun. Flor. Fennica, LVIII, no. 4, p. 29, 1935. Séguy, Gen. Insect., fasc. 205, p. 59, 1937.

Pegomyia (*Pegomyia*) *incisiva* Séguy, Faune de France, VI, p. 162, 1923. Ringdahl, Ent. Tidskr., LIX, hft. 3–4, p. 204, 1938.

The species *incisiva* has the habitus of the european form *flavipes* (Fallén), from which it differs in the male by the shorter bristles on anteroventral surface of hind femur and by the possession of a

series of fine erect hairs on proximal half of posteroventral surface. In addition the third antennal segment is yellowish proximad and scutellum yellowish apicad, the bristles on lower region of occiput are blackish.

I have regarded the large series of female specimens listed below as belonging to this species. In them the frontal vitta, second antennal segment, cephalic half of parafrontals, parafacials and cheeks, are entirely reddish, cruciate bristles present, humeral callosities yellowish, scutellum at least inconspicuously tinged with yellow apicad, presutural series of acrostical bristles slightly nearer one another than to their respective series of dorsocentral bristles, ventral bristle of caudal pair of sternopleurals short, abdomen reddish or brownish tinged, hind tibia with three or four short stout anterodorsal bristles.

ALASKA: 1 ♀, Anchorage, July 19 1921, (J. M. Aldrich), [U. S. N. M.].

ALBERTA: 2 ♀, Edmonton, July 22 1931, (E. H. Strickland); 1 ♀, Lethbridge, June 7 1924, (H. E. Gray), [Univ. Alberta]. 1 ♂, Banff, July 21 1908, (N. B. Sanson); 5 ♀, same locality, June 23 1922; 4 ♀, July 6 1922; 2 ♀, July 10 1922, (C. B. D. Garrett), [C. N. C.].

COLORADO: 1 ♀, Florissant, July 8 1907.

SASKATCHEWAN: 1 ♀, Saskatoon, June 9 1923, (N. J. Atkinson), [C. N. C.].

VERMONT: 1 ♀, Manchester, June 5 1910, [U. S. N. M.].

Pegomyia tenera (Zetterstedt)

Anthomyza tenera Zetterstedt, Ins. Lapponica, p. 697, 1838. Siebke, Enum. Insect. Norveg., IV, p. 126, 1877.

Anthomyia conformis Lundbeck, Vidensk. Medd. naturh. Foren. Kbh., p. 287, 1900.

Pegomyia tenera Stein, Wien. Ent. Zeitg., XXV, p. 82, 1906. Stein, Arch. f. Naturgesch., (1913), LXXIX, (A), hft. 8, p. 36, 1914. Stein, Arch. f. Naturgesch., (1915), LXXXI, (A), hft. 10, p. 127, 1916. Karl, Tierwelt Deutschlands, XIII, pt. 3, p. 125, 1928. Ringdahl, K. Svensk. Veten. Kap. Akad. Skrift. Naturskyddsärenden, nr. 18, p. 21, 1931. Tiensuu, Acta Soc. Faun. Flor. Fennica, LVIII, no. 4, p. 31, 1935. Séguy, Gen. Insect., fasc. 205, p. 64, 1937.

Pegomyia (*Pegomyia*) *tenera* Séguy, Faune de France, VI, p. 165, 1923. Ringdahl, Ent. Tidskr., LIX, hft. 3–4, p. 205, 1938.

Pegomyia tenera obscurior Collin, Ann. Mag. Nat. Hist., ser. 10, VII, p. 84, 1931. Séguy, Gen. Insect., fasc. 205, p. 64, 1937.

The species *tenera* has the typical male hypopygial structure of the *flavipes*-subgroup. There is a considerable degree of variation in extent of infuscation on thorax, abdomen and femora, as is the

tendency in most species belonging to this group. The palpi may be almost entirely yellowish or infuscated apicad; usually the scutellum is yellowish tinged at apex. The species resembles most closely *rufipes* and *incisiva;* in the male it may be distinguished from *rufipes* by the absence of a series of stout setulae on posteroventral surface of hind femur, and from *incisiva* by the weaker series of bristles on proximal half of anteroventral surface of hind femur, and by the entirely black third antennal segment and partly infuscated femora. The female of *tenera* differs from those of *rufipes* and *incisiva* by having the basal tergum of ovipositor yellowish and armed with a series of robust marginal bristles, as in *flavipalpis*.

Collin (1931) has concluded that *tenera* was probably the species that Lundbeck recorded from Greenland as *conformis* (Fallén) and later as *hyoscyami* (Panzer).

ALBERTA: 1 ♂, Nordegg, July 5 1921, (J. McDunnough), [C. N. C.].
QUEBEC: 1 ♂, East Coast, James Bay, August 1920, (F. Johansen), [C. N. C.].
WYOMING: 1 ♀, Yellowstone National Park, Spring Creek, July 15 1923, (A. L. Melander), [A. L. M.].

Pegomyia rectifrons Huckett

Pegomyia rectifrons Huckett, Trans. Amer. Ent. Soc., LXV, p. 19, 1939.
Pegomyia abnormis var. Stein, Arch. f. Naturgesch, (1918), LXXXIV, (A), hft. 9, p. 67, 1920.

Stein (1920) regarded this species as a variant of the described form *abnormis*, in which the eyes of male are abnormally widely separated for a species belonging to this genus. In the male of *rectifrons* the eyes are not unusually widely separated, appearing more normal in this respect than *abnormis*. Under the circumstances it seems to me possible that the male of *abnormis* may represent the true variant, a point that cannot be satisfactorily verified with the limited material at present available for study.

The form *rectifrons*, which I know only in the male sex, may be distinguished from Stein's *abnormis* by the structure and bristling of the head and by the uniform, grayish black color of the abdomen. Another allied species is *anabnormis*, which resembles *rectifrons* but differs in that the humeral callosities and scutellum in male are blackish, concolorous with mesonotum, third antennal seg-

ment entirely blackish, and hind coxae have no hairs on caudal surface.

IDAHO: 1 ♂, Mountains, Moscow, July 10, (R. C. Shannon), *type*, [A. N. S. P.].

Pegomyia tacta Huckett

Pegomyia tacta Huckett, Trans. Amer. Ent. Soc., LXV, p. 16, 1939.

I have placed *tacta* tentatively in the *intersecta*-subgroup, in which I believe it finds its closest affinities. The male of *tacta* may be readily recognized by the peculiar horny appearance of copulatory appendages and by the soft fine bristling on basal sclerite of hypopygium. The prosternum in all specimens that I have seen has a pair of bristles, a character which may occasionally appear in the subfamily as an aberration. The palpi in the male may or may not be tinged with fuscous distad, and in the female sex it is weakly bristled and narrowly spatulate in outline.

ALBERTA: 1 ♂, Edmonton, July 9 1929, (E. H. Strickland), *type*, [C. N. C.]. 1 ♂, same locality, June 13 1936, (E. H. Strickland), *paratype*, [A. N. S. P.]. MANITOBA: 1 ♀, Birtle, August 20 1928, (R. D. Bird), *Allotype*, [C. N. C.].

Pegomyia flavipalpis (Zetterstedt) (Figs. 25, 52, 68.)

Anthomyza flavipalpis Zetterstedt, Dipt. Scand., IV, p. 1707, 1845. Siebke, Enum. Insect. Norveg., IV, p. 122, 1877.

Pegomyia flavipalpis Stein, Wien. Ent. Zeitg., XXV, p. 72, 1906. Stein, Arch. f. Naturgesch., (1913), LXXIX, (A), hft. 8, p. 33, 1914. Stein, Arch. f. Naturgesch., (1915), LXXXI, (A), hft. 10, p. 127, 1916. Ringdahl, Trømso Museums Årshefter, (1926), XLIX, nr. 3, p. 33, 1928. Karl, Tierwelt Deutschlands, XIII, (3), p. 126, 1928. Ringdahl, K. Svensk. Vetenskapsakad. Skrift. Naturskyddsärenden, nr. 18, p. 30, 1931. Tiensuu, Acta Soc. Faun. Flor. Fennica, LVIII, no. 4, p. 30, 1935. Séguy, Gen. Insect., fasc. 205, p. 54, 1937.

Pegomyia (*Pegomyia*) *flavipalpis* Ringdahl, Ent. Tidskr., LIX, hft. 3–4, p. 209, 1938.

The male specimens in the following record agree in every respect with european specimens of *flavipalpis*, but I am not so sure that the females are conspecific. The latter have the humeral callosities and scutellum partly yellowish as in specimens taken in Swedish Lappland in conjunction with a large series of males of *flavipalpis*, but these characters contradict those cited by Stein (1906) in his diagnosis of the species. In addition it may be mentioned that the female fore femur of the above specimens has a

comparatively stronger bristle developed apicad among the posterior median series of bristles, hind tibia has two anterodorsal bristles and the wing membrane is nearly clear. The caudal sclerites of the ovipositor are strongly chitinized and appressed as if for piercing, the basal tergal sclerite of ovipositor (segments 6 + 7) has a series of well developed marginal bristles.

ALBERTA: 1 ♂, Banff, June 17 1922, (C. B. D. Garrett), [C. N. C.]. 1 ♂, 1 ♀, Lake Louise, July 27 1917, [Muséum National d'Histoire Naturelle].

COLORADO: 1 ♂, Tennessee Pass, July 7, 10240 ft. alt., (J. M. Aldrich), [U. S. N. M.].

NOVA SCOTIA: 1 ♀, Kentville, July 13 1924, (R. P. Gorham), [C. N. C.].

ONTARIO: 1 ♀, Ghost River, Lake Abitibi, July 4 1925, (N. K. Bigelow). [C. N. C.].

QUEBEC: 1 ♀, Laniel, July 7 1931, (H. S. Fleming), [C. N. C.].

Pegomyia pollinosa Ringdahl

Pegomyia (*Pegomyia*) *pollinosa* Ringdahl, Ent. Tidskr., LIX, hft. 3–4, p. 209, 1938.
Pegomyia pollinosa Huckett, Trans. Amer. Ent. Soc., LXV, p. 12, 1939.

The following specimens of *pollinosa* were submitted, among others belonging to *Pegomyia*, to Mr. Ringdahl for comparative study. Ringdahl recognized the specimens as being identical with some that he had recently captured near Hälsingborg, Sweden, and to which he later gave the name *pollinosa*. The North American specimens of *pollinosa* that I have seen differ slightly from the male description of european forms in having the antennae, humeral callosities, thoracic pleura and scutellum yellowish tinged, and abdominal terga lacking the dark transverse incisures. The species *pollinosa* structurally resembles *flavipalpis*, from which it differs in the male by having the abdomen largely reddish yellow and marked with a deeper reddish linear dorsocentral stripe, all femora and tibiae entirely yellowish. The female of *pollinosa* differs from that of *flavipalpis* by having three anterodorsal bristles on hind tibia, by the lack of a comparatively stronger developed preapical bristle in the median posterior series of fore femur, and by the yellowish tinge possessed by the wings.

ALASKA: 1 ♂, Anchorage, July 19 1921, (J. M. Aldrich), [U. S. N. M.].

ALBERTA: 1 ♂, Wabamun, July 1 1931, (E. H. Strickland), [C. N. C.].

NEW YORK: 1 ♂, Babylon, Long Island, June 15 1936, (Blanton & Borders); 1 ♀, Cranberry Lake, July 21 1920, [H. C. H.].

NOVA SCOTIA: 1 ♂, Truro, July 12 1913, (R. Matheson), [H. C. H.].
ONTARIO: 1 ♂, Ottawa, June 18 1916, (W. T. M. Forbes), [A. N. S. P.].
QUEBEC: 1 ♀, Abbotsford, June 15 1936, (G. E. Shewell), [C. N. C.].
SOUTH DAKOTA: 1 ♀, Custer, July 19 1924, [South Dakota State Col.].

Pegomyia univittata (von Roser) (Figs. 26, 53, 69.)

Anthomyia univittata von Roser, Correspondenzbl. Württemb. Ver., 1, p. 59, 1840.
Pegomyia univittata Stein, Wien. Ent. Zeitg., XXV, p. 71, 1906. Carter, Ent. Month. Mag., XLIV, p. 129, 1908. Stein, Arch. f. Naturgesch., (1913), LXXIX, (A), hft. 8, p. 33, 1914. Stein, Arch. f. Naturgesch., (1915), LXXXI, (A), hft. 10, p. 127, 131, 1916. Karl, Tierwelt Deutschlands, XIII, pt. 3, p. 126, 1928. Tiensuu, Acta Soc. Faun. Flor. Fennica, LVIII, no. 4, p. 30, 1935. Séguy, Gen. Insect., fasc. 205, p. 65, 1937.
Pegomyia (*Pegomyia*) *univittata* Séguy, Faune de France, VI, p. 165, 1923. Ringdahl, Ent. Tidskr., LIX, p. 205, 1938.

The species *univittata* is closely related to *geniculata*, from which it may be distinguished by the darker coloration in male and presence of dark abdominal incisures in both sexes. In the female the caudal half of frontal vitta is blackened and conjunctival membrane between tergal sclerites of abdomen frequently marked by a stiffening of the chitin, giving the appearance of a smooth narrow plate along the caudal margin, whereas in *geniculata* the frontal vitta is entirely yellowish or at most darkly suffused caudad and intertergal conjunctival membrane is not stiffly chitinized. Further comparisons between the two species may be found in the treatment of *geniculata*.

BRITISH COLUMBIA: 1 ♂, Jordan Meadows, July 12 1928, (W. Downes); 1 ♂, Saint Marys, July 12 1926, (A. A. Dennys), [C. N. C.].

CALIFORNIA: 1 ♂, 1 ♀, Smith River, Rowdy Creek, July 11 1930, (J. M. Aldrich), [U. S. N. M.].

IDAHO: 1 ♀, Moscow Mount, Aug. 10 1924, (A. L. Melander), [A. L. M.].

MASSACHUSETTS: 1 ♂, Washington, August 1; 2 ♂, 5 ♀, Petersham, July 1926, (A. L. Melander), [A. L. M.].

NEW BRUNSWICK: 1 ♂, Frederickton, July 5 1913, [C. N. C.].

NEW HAMPSHIRE: 1 ♂, Milford, June 23 1917; 1 ♂, Mount Washington, July 12 1931, 3500 ft. alt.; 1 ♀, White Mountains, Dolly Copp, July 13 1931, (A. L. Melander), [A. L. M.].

NEW YORK: 1 ♂, Trenton Falls, June 5–8 1921, (Leonard & Forbes); 1 ♀, Shelving Rock Bridge, Lake George, September 2 1920, (M. D. Leonard), [H. C. H.]. 1 ♀, Whiteface Mountain, Adirondacks, July 4 1922, 3800 ft. alt., (J. M. Aldrich),

[U. S. N. M.]. 2 ♀, Slaterville, Wild Flower Preserve, August 16 1928; 1 ♀, McLean Bogs, Tompkins County, August 29 1921; 2 ♀, McLean, September 11 1920; 2 ♀, Ringwood, near Ithaca, August 17 1928; 1 ♂, Ithaca, July 9 1921, [H. C. H.]. 2 ♂, Adirondacks, Avalanche Trail, July 30 1929, (A. L. Melander), [A. L. M.].

NOVA SCOTIA: 1 ♂, Kentville, July 9 1927, (R. P. Gorham); 1 ♀, Truro, September 19 1913, [C. N. C.].

ONTARIO: 1 ♀, Niagara Glen, July 1 1926, (G. S. Walley), [C. N. C.].

PENNSYLVANIA: 2 ♀, Dubois, September 3 1927, (A. L. Melander), [A. L. M.].

QUEBEC: 1 ♀, Hull, September 25 1923; 1 ♀, Aylmer, August 16 1925, (C. H. Curran); 1 ♀, Lake Edward Camp, Laurnetide Limits, September 14 1918; 1 ♂, Queens Park, Aylmer, August 1 1924, (A. R. Graham), [C. N. C.].

SOUTH DAKOTA: 1 ♂, Spearfish, July 28 1924, [South Dakota State Col.].

VERMONT: 30 ♂, Mount Equinox, July 15 1935, (Blanton & Borders), [H. C. H.].

WASHINGTON: 1 ♂, 8 miles west of Snoqualmie Pass, June 29 1924; 2 ♀, Mount Baker, Nooksack River, August 11 1925; 1 ♀, Canyon Creek, July 26 1925, (A. L. Melander), [A. L. M.].

WYOMING: 1 ♀, Yellowstone Park, Clematis Creek, July 9 1923, (A. L. Melander), [A. L. M.].

Pegomyia geniculata (Bouché)

Anthomyia geniculata Bouché, Naturgesch. d. Ins., I, p. 81, 1834.

Anthomyia ephippium Siebke, Enum. Insect. Norveg., IV, p. 128, 1877.

Pegomyia geniculata Stein, Wien. Ent. Zeitg., XXV, p. 74, 1906. Schnabl, Hor. Soc. Ent. Ross., XXXIX, p. 8, 9, 1910. Stein, Arch. f. Naturgesch., (1913), LXXIX, (A), hft. 8, p. 33, 1914. Stein, Arch. f. Naturgesch., (1915), LXXXI, (A), hft. 10, p. 127, 1916. Stein, Arch. f. Naturgesch., (1918), LXXXIV, (A), hft. 9, p. 72, 1920. Malloch, Bull. Brooklyn Ent. Soc., XV, p. 123, 1920. Huckett, Mem. 77, N. Y. (Cornell) Agr. Exp. Station, (1923), p. 44, 1924. Johnson, Occ. Pap. Boston Soc. Nat. Hist., VII, p. 232, 1925. Johnson, Proc. Boston Soc. Nat. Hist., XXXVIII, no. 2, p. 93, 1925. Johnson, Insect Fauna, Biol. Surv. Mt. Desert Region, p. 209, 1927. Karl, Tierwelt Deutschlands, XIII, pt. 3, p. 128, 1928. Huckett, Mem. 101, N. Y. (Cornell) Agr. Exp. Station, (1926), p. 840, 1928. Tiensuu, Acta Soc. Faun. Flor. Fennica, LVIII, no. 4, p. 29, 1935. Séguy, Gen. Insect., fasc. 205, p. 56, 1937.

Pegomyia (*Pegomyia*) *geniculata* Schnabl and Dziedzicki, Abh. K. Leop.-Carol. Deutsch. Akad. Naturforsch., XCV, nr. 2, p. 112, 1911. Séguy, Faune de France, VI, p. 160, 1923. Ringdahl, Ent. Tidskr., LIX, hft. 3–4, p. 203, 1938.

The species *geniculata* is pale yellowish in color as in *unicolor* and *gilva*. Occasional specimens may have abdomen more or less blackened and thorax brownish tinged. In general habitus the

species closely resembles *univittata*, having the antennae large and prominently set in profile, reaching ventrad to oral margin, face is flattish ventrad, anterior margin of eye viewed in profile almost extended to a level with facial margin, presutural series of acrostical bristles are very widely set apart, having a few setulae between the series, in the male the processes are inconspicuous. In the female of *geniculata* and *univittata* the fore femur has a comparatively stronger developed bristle apicad among the median series on posterior surface, cruciate bristles are seldom present, caudal pair of ocellar bristles is comparatively short and directed forward, and caudal segments of ovipositor are weakly chitinized and bear tufts of short black setulae laterad.

The male of *geniculata* differs from that of *univittata* in having the thoracic pleura pale yellow, with at most one or two restricted brownish suffusions, and abdominal terga usually pale yellow, if blackish suffused the caudal margin of each tergum remains pale yellow; whereas in the male of *univittata* the pleura are largely brownish suffused or fuscous, and the terga have dark incisures along caudal margin or are extensively blackish tinged. In the female the tergal color and markings of *geniculata* differ from those of *univittata* as in male, and in addition there is no stiffening of the intertergal conjunctival membrane as is frequently apparent in *univittata*.

ALBERTA: 1 ♂, 1 ♀, Wabamun, July 9 1936; 1 ♀, Gull Lake, June 28 1929; 2 ♂, Edmonton, June 10 1937, (E. H. Strickland), [Univ. Alberta].

BRITISH COLUMBIA: 3 ♂, 4 ♀, Keremeos, June 22 1923, (C. B. D. Garrett); 1 ♂, 1 ♀, Saint Marys, July 12 1926, (A. A. Dennys), [C. N. C.]. 1 ♀, Carbonate to Columbia River, July 7–12 1908, 2600 ft. alt., (J. C. Bradley). [C. U.].

MASSACHUSETTS: 1 ♀, Brookline, July 7 1903; 1 ♂, Petersham, June 6 1932, (A. L. Melander), [A. L. M.].

MICHIGAN: 2 ♀, Isle Royale, August 3–7 1936, (C. W. Sabrosky); 1 ♀, Grand Rapids, July 1 1937, (Hansens), [Mich. State Col.].

NEW BRUNSWICK: 1 ♀, Frederickton, July 5 1913, [C. N. C.].

NEW YORK: 1 ♂, 1 ♀, Herkimer, August 8 1921, (M. D. Leonard); 1 ♂, Pond at foot of Mount Redfield, Essex County, July 25 1920, 2500 ft. alt.; 1 ♂, 1 ♀, Ringwood, near Ithaca, June 13 1920, [H. C. H.]. 1 ♂, Peekskill, June 11 1927, (A. L. Melander), [A. L. M.].

ONTARIO: 1 ♂, Ottawa, June 2 1927; 1 ♀, Lyn, June 7 1926, (C. H. Curran);

1 ♂, Niagara Glen, July 1 1926, (G. S. Walley); 1 ♂, Orillia, June 20 1927, [C. N. C.]. 3 ♂, 2 ♀, Waubamick, June 1915, (H. S. Parish), [A. L. M.].

QUEBEC: 2 ♂, 1 ♀, Covey Hill, June 25 1927, (W. J. Brown), [C. N. C.].

SOUTH DAKOTA: 1 ♂, Custer, July 22 1924, [South Dakota State Col.].

VERMONT: 1 ♀, Burlington, June 23 1906.

WASHINGTON: 2 ♂, Big Four Mountain, July 5 1924; 1 ♀, Nasel, July 2 1925; 1 ♀, Mount Vernon, July 3 1924; 1 ♀, 8 miles West of Snoqualmie Pass, June 29 1924, (A. L. Melander), [A. L. M.].

WISCONSIN: 1 ♂, Madison, June 4 1930; 1 ♀, Racine, July 18 1929, (R. Bushnell), [Univ. Wisc.].

Pegomyia spinosissima Stein

Pegomyia spinosissima Stein, Berl. Ent. Zeitschr., (1897), XLII, p. 242, 1898. Stein, Arch. f. Naturgesch., (1917), LXXXIII, (A), hft. 1, p. 149, 1919. Stein, Arch. f. Naturgesch., (1918), LXXXIV, (A), hft., 9, p. 72, 1920. Malloch, Bull. Brooklyn Ent. Soc., XV, p. 124, 1920. Séguy, Gen. Insect., fasc. 205, p. 63, 1937.

In the male of *spinosissima* and *spinigerella* the costal vein has strongly developed setulae, which in *spinosissima* are placed sparsely or intermittently along the vein and are conspicuously long, whilst in *spinigerella* they are in close serial arrangement and are slightly shorter. In both male and female of *spinosissima* the third antennal segment is largely yellowish, cheeks and interfrontalia are yellowish and concolorous with palpi, mid femur has no bristle on distal half of anteroventral surface; whereas in *spinigerella* the third antennal segment is largely blackish, interfrontalia and cheeks deep reddish, and mid femur has a bristle on distal half of anteroventral surface. In both species the apical posterodorsal bristle on fore and hind tibiae is well developed. Malloch (1920) in his key to males of *Pegomyia* credits both species with having a bristle on distal half of anteroventral surface of mid femur. I am informed by Mr. Gerhard that this is not so in the type specimen of *spinosissima* in the Hough Collection at the Field Museum, and the specimens before me agree with the type in this respect.

KANSAS: 1 ♂, Lawrence, *cotype*, [Field Museum]. 1 ♂, 1927, on alfalfa, (R. C. Smith), [U. S. N. M.].

NORTH DAKOTA: 1 ♂, University, June 1896, (R. P. Currie), [U. S. N. M.].

OKLAHOMA: 1 ♀, Stillwater, July 6 1935, (J. Stankavitch), [Okla. A. & M. Col.].

TEXAS: 1 ♂, College Station, May 9 1934; 1 ♀, May 22 1917, (H. J. Reinhard), [Texas A. & M. Col.].

Pegomyia gopheri Johnson (Figs. 19, 48, 80.)

Pegomyia gopheri Johnson, Bull. Amer. Mus. Nat. Hist., XXXII, p. 77, 1913. Stein, Arch. f. Naturgesch., (1917), LXXXIII, (A), hft. 1, p. 148, 1919. Malloch, Bull. Brooklyn Ent. Soc., XV, p. 124, 1920. Séguy, Gen. Insect., fasc. 205, p. 56, 1937.

The species *gopheri* closely resembles *finitima* Stein, differing in that the third antennal segment is more extensively yellowish tinged, and the mid tibia has no mid anteroventral bristle.

GEORGIA: 5 ♀, Blythe, Richmond County, April 26 1932, from gopher burrows, (F. Harper), [H. C. H.].

ILLINOIS: 1 ♂, Dubois, May 10 1916, [Ill. N. H. S.].

KANSAS: 2 ♀, Riley County, September 22.

NEW YORK: 1 ♂, Riverhead, Long Island, June 10 1926; 1 ♀, Ithaca, May 28 1922, [H. C. H.].

OHIO: 1 ♂, Sandusky, Cedar Point, July 15 1903, [Ohio State Univ.].

PENNSYLVANIA: 1 ♂, Montgomery County, September 11 1897.

TEXAS: 1 ♀, Brownsville, June 8 1904, [Texas A. & M. Col.].

WISCONSIN: 1 ♂, Dane County, July 7 1936 (F. M. Snyder), [Univ. Wisc.].

Pegomyia finitima Stein

Pegomyia finitima Stein, Berl. Ent. Zeitschr., (1897), XLII, p. 241, 1898. Aldrich, Misc. Coll. Smithsn. Inst., XLVI, no. 1444, p. 558, 1905. Stein, Arch. f. Naturgesch., (1917), LXXXIII, (A), hft. 1, p. 148, 1919. Stein, Arch. f. Naturgesch., (1918), LXXXIV, (A), hft. 9, p. 72, 1920. Malloch, Bull. Brooklyn Ent. Soc., XV, p. 124, 1920. Johnson, Occ. Pap. Boston Soc. Nat. Hist., VII, p. 232, 1925. Séguy, Gen. Insect., fasc. 205, p. 54, 1937.

The species *finitima* and *gopheri* are very similar in many respects. Both species usually possess one or more pteropleural setulae near the caudal pair of sternopleural bristles; these setulae are absent in *affinis*. In *finitima* the mid tibia has a mid anteroventral bristle, and the third antennal segment is more deeply tinged with black than in *gopheri*. The genitalia of the two species are structurally identical.

ILLINOIS: 1 ♀, Algonquin, August 21 1894, *cotype*, [Ill. N. H. S.]. 1 ♂, McHenry, August 21 1927, (A. L. Melander), [A. L. M.].

IOWA: 1 ♀, Sioux City, August 17 1927.

KANSAS: 1 ♀, Riley County, July 10; 1 ♂, Onaga, [U. S. N. M.]. 1 ♀, Manhattan, April 25 1934, (C. W. Sabrosky), [Mich. State Col.].

MASSACHUSETTS: 1 ♂, Southampton, July 9, [A. N. S. P.].

MICHIGAN: 1 ♀, Cheboygan County, August 7 1931, (C. W. Sabrosky), [Mich. State Col.].

SOUTH DAKOTA: 1 ♂, Brookings, *cotype*, [Field Museum].

WISCONSIN: 2 ♂, Dane County, July 10 1936, (F. M. Snyder), [Univ. Wisc.].

Pegomyia cedrica Huckett

Pegomyia cedrica Huckett, Trans. Amer. Ent. Soc., LXV, p. 21, 1939.

This robust species is not to be readily associated with others belonging to the genus. I have included it in the *rubivora*-group on account of similarities in character of male and female copulatory appendages and owing to the fact that the prebasal sclerite of hypopygium is bristled. In contrast to other species of the group *cedrica* has the legs, abdomen and scutellum entirely yellow.

OHIO: 1 ♂, 1 ♀, Sandusky, Cedar Point, May 30 1903, (J. S. Hine), *type* and *allotype*, [Ohio State Univ.].

Pegomyia pertusa Huckett

Pegomyia pertusa Huckett, Trans. Amer. Ent. Soc., LXV, p. 8, 1939.

The male of *pertusa* superficially resembles the species belonging to the *hyoscyami*-subgroup, differing from many of such species by having the eyes almost contiguous in male. The processes are robust and clothed along greater part of inner border with a dense series of longish setulae, the apical region is bare and tapering. The type specimen is slightly teneral, hence it seems possible that in mature specimens the yellowish areas on abdomen and scutellum may be greatly subdued or become entirely grayish drab.

ALBERTA: 1 ♂, Edmonton, May 8 1937, (F. O. Morrison), *type*, [A. N. S. P.].

Pegomyia bicolor (Wiedemann)

Anthomyia bicolor Wiedemann, Zool. Mag., I, p. 77, 1817.

Pegomyia bicolor Macquart, Hist. Nat. Ins. Dipt., II, p. 351, 1835. Stein, Berl. Ent. Zeitschr., (1897), XLII, p. 239, 1898. Aldrich, Misc. Coll. Smithsn. Inst., XLVI, no. 1444, p. 558, 1905. Stein, Wien. Ent. Zeitg., XXV, p. 75, 1906. Schnabl, Hor. Soc. Ent. Ross., XXXIX, p. 8, 9, 1910. Schnabl, Deutsch. Ent. Zeitschr., hft. 6, p. 81, 1911. Stein, Arch. f. Naturgesch., (1913), LXXIX, (A), hft. 8, p. 33, 1914. Stein, Zool. Jahrbüchern, XXXIX, hft. 1, p. 137, 1915. Stein, Arch. f. Naturgesch., (1915), LXXXI, (A), hft. 10, p. 127, 1916. Malloch, Trans. Amer. Ent. Soc., XLIV, p. 303, 1918. Stein, Arch. f. Naturgesch., (1918), LXXXIV, (A),

hft. 9, p. 72, 1920. Malloch, Bull. Brooklyn Ent. Soc., XV, p. 123, 1920. Cole and Lovett, Proc. Cal. Acad. Sci., XI, p. 313, 1921. Huckett, Mem. 77, N. Y. (Cornell) Agr. Exp. Station, (1923), p. 43, 1924. Hering, Zeitschr. Morph. Ökolog. Tiere, II, hft. 2, p. 247, 1924. Frost, Mem. 78, N. Y. (Cornell) Agr. Exp. Station, (1923), p. 100, 1924. Johnson, Occ. Pap. Boston Soc. Nat. Hist., VII, p. 232, 1925. Johnson, Insect Fauna, Biol. Surv. Mt. Desert Region, p. 209, 1927. Karl, Tierwelt Deutschlands, XIII, pt. 3, p. 124, 1928. Huckett, Mem. 101, N. Y. (Cornell) Agr. Exp. Station, (1926), p. 840, 1928. Ringdahl, K. Svensk. Veten. Kap. Akad. Skrift. Naturskyddsärenden, nr. 18, p. 21, 1931. Tiensuu, Acta Soc. Faun. Flor. Fennica, LVIII, no. 4, p. 30, 1935. Séguy, Gen. Insect., fasc. 205, p. 52, 1937.

Anthomyia (*Pegomyia*) *bicolor* Strobl, Verh. zool.-bot. Ges. Wien, XLIII, p. 251, 1893.

Pegomyia (*Pegomyia*) *bicolor* Schnabl and Dziedzicki, Abh. K. Leop.-Carol. Deutsch. Akad. Naturforsch., XCV, nr. 2, p. 112, 1911. Séguy, Faune de France, VI, p. 158, 1923. Ringdahl, Ent. Tidskr., LIX, hft. 3–4, p. 198, 1938.

Hylemyia bicolor Hallock and Parker, Circ. 103, N. J. Dept. Agr., p. 16, 1926.

The species *bicolor* is typical of a small group of pegomyian flies which may invariably be associated with each other on account of the common characteristic form of the male processes (fig. 90). Such a group includes the North American species *triseta* and *jacobi* and the european form *atritarsis* (Zetterstedt). In *bicolor* the third antennal segment and scutellum are invariably entirely blackish, second segment may be entirely reddish, brownish or black. In *triseta* these parts are usually partly yellowish.

ALASKA: 5 ♂, 1 ♀, Katmai, June 1917, (J. S. Hine), [Ohio State Univ.].

BRITISH COLUMBIA: 1 ♀, Royal Oak, May 20 1917, (R. C. Treherne); 1 ♂, Victoria, May 1924, (W. Downes), [C. N. C.].

IDAHO: 1 ♀, Sweetwater, June 19 1930, [U. S. N. M.]. 1 ♀, Waha, August 12 1923, (A. L. Melander), [A. L. M.].

NEW BRUNSWICK: 2 ♀, Greys Mills, September 8 1922, (R. P. Gorham), [C. N. C.].

NEW YORK: 1 ♂, Coy Glen, near Ithaca, May 14 1922; 4 ♂, Ithaca, May 28 1922; 1 ♂, Wild Flower Preserve, Slaterville, August 16 1928; 2 ♂, 1 ♀, Harmon, July 5 1926; 1 ♂, Taughanic Falls, August 18 1928; 1 ♂, Riverhead, Long Island, August 6 1922; 1 ♀, Orient, Long Island, May 14 1936; 1 ♀, Southampton, Long Island, July 15 1923; 1 ♂, Greenlawn, Long Island, August 15 1922; 2 ♂, 1 ♀, Aquebogue, Long Island, June 8 1936, (*ex Rumex acetosa*); 1 ♂, 1 ♀, Babylon, Long Island, May 10 1923, (F. S. Blanton), [H. C. H.].

OHIO: 1 ♂, Amherst, July 1933, [Texas A. & M. Col.].

ONTARIO: 1 ♂, Whitby, July 6 1926, (C. H. Curran), [C. N. C.].

OREGON: 1 ♀, Bellefountain, May 27 1922, (A. L. Lovett); 3 ♂, 5 ♀, no data, [Ore. State Col.].

PENNSYLVANIA: 1 ♂, Lake Leboeuf, Erie County, August 19 1924, (H. Kahl), [Carnegie Museum]. 1 ♂, Mineral Spring, September 5 1927; 1 ♂, 1 ♀, Dubois, September 3 1927, (A. L. Melander), [A. L. M.].

QUEBEC: 1 ♂, Knowlton, June 20 1927, (G. S. Walley), [C. N. C.].

VERMONT: 1 ♂, Peru, July 15 1931, (A. L. Melander), [A. L. M.].

WASHINGTON: 1 ♂, Cascade Lake, Orcas Island, August 17 1925; 1 ♀, Nooksack River, Mount Baker, Aug. 11 1925, (A. L. Melander), [A. L. M.].

WYOMING: 1 ♂, Turbid Lake, Yellowstone Park, July 20 1923, (A. L. Melander), [A. L. M.].

Pegomyia triseta Malloch (Figs. 24, 86, 91)

Pegomyia calyptrata Stein not Zetterstedt, Berl. Ent. Zeitschr., (1897), XLII, p. 237, 1898.

Pegomyia triseta Malloch, Trans. Amer. Ent. Soc., XLVI, p. 177, 1920. Malloch, Bull. Brooklyn Ent. Soc., XV, p. 123, 1920. Johnson, Occ. Pap. Boston Soc. Nat. Hist., VII, p. 233, 1925.

Pogonomyia triseta Séguy, Gen. Insect., fasc. 205, p. 320, 1937.

The species *triseta* resembles *bicolor*, from which it differs by having third antennal segment and scutellum partly yellowish. In both species the apical posterodorsal bristle on hind tibia is strongly developed and in male the processes are typically short and weakly bristled, being rounded and bare on apical region.

Stein (1898) described the species as *calyptrata* (Zetterstedt), as indicated by the specimens in the Illinois Natural History Survey and Field Museum collections. According to Ringdahl (1938) *calyptrata* is identical with Stein's species *Pegomyia iniqua* (1906), a proposal which if accepted would provide a tangible means of evaluating the relationship between *triseta* and *calyptrata*. I have regarded the two species as probably distinct, since *calyptrata* and *iniqua* evidently possess more the characteristics of *winthemi* than of *bicolor*.

ALBERTA: 1 ♂, Lethbridge, May 6 1923, [C. N. C.].

BRITISH COLUMBIA: 1 ♀, Oliver, May 8 1923, (C. B. C. Garrett); 1 ♀, Royal Oak, July 31 1917, (W. Downes), [C. N. C.].

ILLINOIS: 1 ♂, White Heath, June 24 1916; 1 ♀, Urbana, August 4 1916, [Ill. N. H. S.].

MANITOBA: 1 ♂, Aweme, October 4 1923, (N. Criddle), [C. N. C.].

NEW YORK: 1 ♂, Ithaca, June 1 1916, [H. C. H.].

OHIO: 1 ♀, Columbus, June 1 1904, (J. S. Hine), [Ohio State Univ.].

ONTARIO: 1 ♀, Sudbury, July 13 1889; 1 ♀, Trenton, August 13 1901, (Evans); 1 ♂, Cornwall, June 27 1925, (F. Ide), [C. N. C.].

PENNSYLVANIA: 1 ♂, Tinicum Island, April 25 1900, (C. T. Greene), [U. S. N. M.].

SOUTH DAKOTA: 1 ♂, Custer, July 15 1924; 1 ♀, Big Stone, August 18 1924, [South Dakota State Col.].

WISCONSIN: 1 ♂, Dane County, July 6 1936, (F. M. Snyder), [Univ. Wisc.].

Pegomyia rufipes (Fallén)

Musca rufipes Fallén, Muscides, p. 85, 1825.

Pegomyia rufipes Stein, Ent. Nachr., XVIII, p. 331, 1892. Stein, Wien. Ent. Zeitg., XXV, p. 81, 1906. Schnabl, Hor. Soc. Ent. Ross., XXXIX, p. 107, 1910. Stein, Arch. f. Naturgesch., (1913), LXXIX, (A), hft. 8, p. 36, 1914. Stein, Arch. f. Naturgesch., (1915), LXXXI, (A), hft. 10, p. 125, 1916. Ringdahl, Trømso Museums Årshefter, (1926), XLIX, no. 3, p. 33, 1928. Karl, Tierwelt Deutschlands, XIII, p. 138, 1928. Collin, Ann. Mag. Nat. Hist., ser. 10, VII, p. 67, 1931. Ringdahl, K. Svensk. Veten. Kap. Akad. Skrift. Naturskyddsärenden, nr. 18, p. 21, 1931. Tiensuu, Acta Soc. Faun. Flor. Fennica, LVIII, no. 4, p. 29, 1935. Séguy, Gen. Insect., fasc. 205, p. 62, 1937.

Pegomyia crassicauda Stein, Entom. Nachr., XXVI, p. 320, 1900.

Hylemyia pedestris Malloch, Can. Ent., LI, p. 274, 1919. Frison, Bull. Ill. Nat. Hist. Surv., XVI, p. 202, 1927. Séguy, Gen. Insect., fasc. 205, p. 106, 1937.

Pegomyia pedestris Malloch, Bull. Brooklyn Ent. Soc., XV, p. 126, 1920.

Pegomyia (*Pegomyia*) *rufipes* Séguy, Faune de France, VI, p. 163, 1923, Ringdahl, Ent. Tidskr., LIX, hft. 3–4, p. 204, 1938.

The male of *rufipes* may be readily identified by the series of ten or more closely set stout setulae along posteroventral surface of hind femur. The female has palpi infuscated apicad, third antennal segment entirely black, mesonotum grayish black, opaque, with considerable areas adjoining and including scutellum and humeral callosities yellowish, pleura are more or less blackish with more or less yellowish tinge, fore femur has a comparatively stronger bristle developed apicad among posterior median series of bristles, series of presutural acrosticals slightly nearer to one another than to their respective series of dorsocentral bristles, ovipositor strongly chitinized and compressed as if for piercing, marginal bristles on abdominal terga well developed on ventral aspect. In most of the foregoing characters the female of *rufipes* resembles that of *tenera*, differing only in that the series of presutural acrostical bristles are more closely approximated in *rufipes*.

Malloch (1920) has in error used the name *rufipes* to denote his *flavipes* in the key to males of *Pegomyia*. There has also crept in an error in Collin's (1931) discussion of the differences between males of the two species *rufipes* and *flavipes*, which may prove confusing to the student. It is evident from the text that in the comparison between male characters of the two species the names *rufipes* and *flavipes* have been wrongly applied and should be interchanged to put a proper construction on the statements.

BRITISH COLUMBIA: 1 ♀, Agassiz, May 7 1926, (R. Glendenning), [C. N. C.].
MASSACHUSETTS: 1 ♀, Petersham, July 1926, (A. L. Melander), [A. L. M.].
ONTARIO: 1 ♀, Orillia, July 1923, (C. H. Curran), [C. N. C.],
QUEBEC: 1 ♂, Godbout, July 25 1918, (E. M. Walker), *paratype* of *pedestris* Mall. [Ill. N. H. S.].
YUKON TERRITORY: 1 ♂, Selkirk, June 13 1909, (H. G. Dyar), [U. S. N. M.].

Pegomyia variegata Huckett

Pegomyia variegata Huckett, Trans. Amer. Ent. Soc., LXV, p. 11, 1939.

I have included the species *variegata* in the *bicolor*-subgroup largely on account of resemblances in the structure of processes in male. The species has the palpi largely fuscous, third antennal segment yellowish tinged proximad, apical posterodorsal bristle on fore and hind tibiae well developed. The parafrontals of the male may be contiguous or slightly separate, and the fore femur may be yellow or tinged with fuscous. The female allotype specimen has cruciate bristles present.

MARYLAND: 1 ♂, College Park, September 7 1912, mining *Chenopodium ambrosioides*, 1 ♀; same locality, September 2 1912, *type* and *allotype*, [U. S. N. M.].
NORTH CAROLINA: 1 ♂, Wilmington, August 4 1919, [H. C. H.].

Pegomyia marginata Huckett

Pegomyia marginata Huckett, Trans. Amer. Ent. Soc., LXV, p. 7, 1939.

The male of *marginata* may be distinguished by the pronounced lamellate fold extending from inner margin of processes mesad and by the accompanying series of slender setulae from base to apex. This type of process is also present in the european species *strigipes* (Zetterstedt). The female of *marginata* has the palpi enlarged and flattened, cruciate bristles absent, caudal pair of ocellar

bristles short and directed forward, and *m–cu* cross vein erect. The scutellum is entirely blackish in both sexes.

BRITISH COLUMBIA: 1 ♂, Vancouver, August 25 1926, (J. Stanley), [C. N. C.].
IDAHO: 1 ♂, Lake Waha, July 22 1927; 1 ♀, Newman Lake, May 16 1925, (A. L. Melander), *allotype*, [A. L. M.].
WASHINGTON: 1 ♂, Orcas Island, above Mt. Lake, August 8 1925, (A. L. Melander), *type*, [A. L. M.].

Pegomyia setaria (Meigen) (Figs. 23, 85, 92.)

Anthomyia setaria Meigen, Syst. Beschr., v, p. 178, 1826. Neuhaus, Diptera Marchica, p. 227, 1886.
Pegomyia setaria Stein, Wien. Ent. Zeitg., xxv, p. 99, 1906. Stein, Arch. f. Naturgesch., (1913), lxxix, (A), hft. 8, p. 35, 1914. Stein, Arch. f. Naturgesch., (1915), lxxxi, (A), hft. 10, p. 124, 1916. Hering, Zeitschr. Morph. Ökolog. Tiere, ii, p. 250, 1924. Karl, Tierwelt Deutschlands, xiii, pt. 3, p. 135, 1928. Tiensuu, Acta Soc. Faun. Flor. Fennica, lviii, no. 4, p. 28, 1935. Séguy, Gen. Insect., fasc. 205, p. 62, 1937.
Pegomyia (*Pegomyia*) *setaria* Séguy, Faune de France, vi, p. 164, 1923.
Pegomyia polygoni Seamans, Can. Ent., lxv, p. 221, 1923. Séguy, Gen. Insect., fasc. 205, p. 61, 1937.
Pegomyia (*Chaetopegomyia*) *setaria* Ringdahl, Ent. Tidskr., lxv, p. 196, 1938.

The species was first recorded by Seamans (1923) from Manitoba under the name *polygoni*, the larvae of which were found to mine the leaves of *Polygonum convolvulus* L. I have compared specimens of *polygoni* with the european species *setaria* (Meigen), which is also reported as a leaf-miner of *P. convolvulus* by Hering (1924), and find that there does not appear to be sufficient difference between the two forms to warrant their recognition as separate species. I find it difficult to associate the species with any particular grouping within the genus. Stein (1906) compares the species with *longimana* (Pokorny) belonging to the *lipsia*-group; Ringdahl (1938) has placed the species in a special subgenus, *Chaetopegomyia*. I am inclined to believe that *setaria* may be more closely linked to the *bicolor*-group as indicated by the character of the cross veins, acrostical series, and caudal pair of ocellar bristles in female. In *setaria* the processes are more pliant and slender than in *bicolor*, but essentially the form and bristling have much in common in the two species. Moreover the vestiture on ventral surface of tibiae in both species seems to be accentuated

by the slightly greater length of setulae. The species *setaria* may be readily distinguished from allied forms by having the thorax and abdomen grayish black; in addition the palpi are entirely fuscous, fore femora entirely yellowish, fore tibia has a robust apical posterodorsal bristle, and caudal intraalar bristle is exceptionally long, being about equal to length of caudal dorsocentral bristle.

BRITISH COLUMBIA: 1 ♀, Agassiz, May 29 1922, (R. Glendenning), [C. N. C.].
MANITOBA: 1 ♂, Aweme, May 25 1921; 1 ♀, same locality, May 24 1921, (N. Criddle), *type* and *allotype* of *polygoni* Seamans, [C. N. C.].
MASSACHUSETTS: 1 ♀, Chester, August 3 1911, [H. C. H.].
ONTARIO: 1 ♂, Port Hope, May 25 1925, (N. K. Bigelow), [C. N. C.].
SASKATCHEWAN: 1 ♀, Saskatoon, June 17 1924, (K. M. King), [C. N. C.].

Pegomyia vicaria Huckett

Pegomyia vicaria Huckett, Trans. Amer. Ent. Soc., LXV, p. 6, 1939.

The species *vicaria* conforms closely to the structure and chaetotaxy of *ruficeps*, *rufescens* and *striata* in the *hyoscyami*-group. In the male of *vicaria* the antennae and palpi are blackish, prealar bristle absent, fore and mid tibiae lack a mid anterodorsal bristle and mid femora have no proximal series of bristles nor preapical bristle on anterior surface. There is at least a trace of yellowish suffusion on humeral callosities and scutellum. In the paratypes the abdominal terga are almost entirely grayish black, and the fore femora entirely yellowish or partly infuscated. In the holotype the abdominal terga are characterized by the presence of considerable areas of paler (clay) color.

WASHINGTON: 1 ♂, Lind, August 18 1919, (F. W. Carlson), *type*, [A. N. S. P.]. 2 ♂, same locality and date as type, *paratypes*, [A. L. M.].

Pegomyia tinctisquama Huckett

Pegomyia tinctisquama Huckett, Trans. Amer. Ent. Soc., LXV, p. 26, 1939.

The male of *tinctisquama* has the thorax mostly deep black, calyptrae infuscated and abdomen reddish. The palpi are entirely fuscous and processes largely shining and bare and with setulae only along proximal half of inner margin. Superficially the male has the appearance of *marginata* in that the thorax is deep blackish

and calyptrae infuscated, but the two species may be separated on characters pertaining to fifth sternum. The female may be readily distinguished on account of the abnormally large palpi, which are broader than proboscis and protrude conspicuously beyond oral margin, abdomen largely grayish drab with an inconspicuous reddish tinge, calyptrae are intensively yellowish and caudal pair of ocellar bristles longish and directed outward.

ALBERTA: 1 ♀, Banff, July 10 1922, (C. B. D. Garrett), *allotype*, [C. N. C.].
BRITISH COLUMBIA: 1 ♂, Keremeos, June 20 1923, (C. B. D. Garrett), *type* [C. N. C.].
WASHINGTON: 1 ♂, Puyallup, July 30 1933, (Wm. Baker), [H. C. H.].

Pegomyia palpata Stein

Pegomyia palpata Stein, Wien. Ent. Zeitg., XXV, p. 101, 1906. Stein, Arch. f. Naturgesch., (1913), LXXIX, (A), hft. 8, p. 36, 1914. Séguy, Faune de France, VI, p. 163, 1923. Karl, Tierwelt Deutschlands, XIII, pt. 3, p. 141, 1928. Séguy, Gen. Insect., fasc. 205, p. 61, 1937.

The specimen from Vermont agrees in every important respect with Stein's (1906) and Karl's (1928) description of the species. There is little doubt in my mind regarding its identity as *palpata* Stein not Schnabl. Stein (1916) has pointed out that Schnabl (1911) in error has used this name to denote Stein's species *palposa*. The female of *palpata* in common with that of *marginata* and *tinctisquama* has extra large flat palpi which are sparsely clothed with fine setulae and which are considerably infuscated. The female of *palpata* may be distinguished from that of *marginata* by the strongly developed cruciate bristles and caudal pair of ocellar bristles, and from that of *tinctisquama* by the reddish abdomen and darker colored fore and mid tibiae. In the specimens before me the abdomen of females of *marginata* and *tinctisquama* is grayish or brownish drab and noticeably subshining.

VERMONT: 1 ♀, Mount Ascutney, July 11 1908, 2500 ft. alt.

Pegomyia sitiens Huckett

Pegomyia sitiens Huckett, Trans. Amer. Ent. Soc., LXV, p. 9, 1939.

The species *sitiens* structurally resembles the european form *esuriens* (Meigen), differing only in the general color of second

antennal segment and abdomen, which is reddish, and in the contrasting paler and darker regions of the palpi. In *esuriens* these parts are entirely blackish or brownish. In the series of specimens before me there is a wide degree of variation in extent to which the abdomen is tinged with fuscous. In two specimens, male and female, the abdomen appears extensively grayish black with fuscous dorsocentral vitta. In the male the frontal vitta may be continuous or interrupted at middle by approximation of parafrontals, mid and hind femora may be entirely yellowish or have a fuscous area on dorsal surface apicad, and in one or two specimens the wings appear slightly brownish tinged. I consider the species to be more closely linked to the *albimargo*-subgroup than to that of *bicolor* or *hyoscyami* chiefly on account of the interserial markings on male mesonotum.

ALASKA: 1 ♀, Fairbanks, June 31 1921, [U. S. N. M.].

ALBERTA: 1 ♂, Lethbridge, June 6 1923, (H. L. Seamans); 1 ♀, Banff, July 16 1922, (C. B. D. Garrett), *type* and *allotype*, [C. N. C.]. 1 ♂, Brooks, May 20 1923 (Walter Carter); 1 ♀, Tilley, June 11 1923, [C. N. C.]. 1 ♂, Edmonton, May 15 1937, *paratype*, [A. N. S. P.]. 1 ♂, Wetaskiwin, May 6 1937, (F. O. Morrison), [Univ. Alberta].

BRITISH COLUMBIA: 1 ♀, Oliver, June 6 1923, (C. B. D. Garrett), [C. N. C.].

CONNECTICUT: 1 ♂, Watertown, June 5 1931, (A. L. Melander), *paratype*, [A. L. M.].

MANITOBA: 1 ♀, Treesbank, June 3 1925, (R. M. White), [C. N. C.].

NEW YORK: 1 ♂, Montezuma Marshes, Cayuga County, July 1 1920; 1 ♂, Valley Stream, Long Island, April 27 1921, [H. C. H.].

ONTARIO: 1 ♀, Port Hope, May 25 1925, (N. K. Bigelow), [C. N. C.].

SASKATCHEWAN: 2 ♂, Regina, June 5 1904, (T. N. Willing), [C. N. C.].

SOUTH DAKOTA: 1 ♂, Brookings, July 19 1925, (H. C. Severin), [South Dakota State Col.].

WISCONSIN: 1 ♀, Dane County, July 10 1936, (F. M. Snyder), [Univ. Wisc.].

WYOMING: 1 ♀, Yellowstone Canyon, July 12 1922; 1 ♀, Yellowstone Park, Clematis Creek, July 9 1923, (A. L. Melander), *paratypes*, [A. L. M.].

Pegomyia carduorum Huckett

Pegomyia carduorum Huckett, Trans. Amer. Ent. Soc., LXV, p. 1, 1939.

The species *carduorum* belongs to the *hyoscyami*-subgroup. In the male it may be distinguished by the yellowish bare truncated processes, absence of bristle at middle of anterodorsal surface of

mid tibia, faintly yellowish tinge to scutellum and decidedly yellowish calyptrae, yellowish to reddish abdomen. The female of *carduorum* has no mid anterodorsal bristle on fore tibia, marginal bristles on tergum 5 and ventral bristle of caudal pair of sternopleurals are weakly developed, and scutellum and calyptrae, as in male, have a yellowish tinge.

Adults have been reared from larvae mining the leaves of *Cirsium discolor*,[38] and in this respect the species displays habits similar to that of the european form *P. steini* Hendel,[39] the larvae of which are known to mine the leaves of several species of Cirsium. I have been able to examine the male of *steini* through the courtesy of Dr. Martin Hering, and find that the two species differ in many respects as indicated by the structure of the copulatory appendages, color of palpi and breadth of frons.

ALBERTA: 1 ♂, Edmonton, July 13 1936, (E. H. Strickland), [C. N. C.].

NEW YORK: 1 ♂, 1 ♀, Riverhead, Long Island, July 3 1937, *ex Cirsium discolor*, [H. C. H.].

PENNSYLVANIA: 1 ♀, Arendtsville, July 6 1927, (S. W. Frost), *allotype*, [A. N. S. P.]. 1 ♂, same locality, July 3 1927, *ex Cirsium*, [H. C. H.].

SOUTH DAKOTA: 1 ♂, Elk Point, June 19 1924, [South Dakota State Col.].

WASHINGTON: 1 ♀, Mount Rainier, White River, July 20 1924, (A. L. Melander), [A. L. M.].

WISCONSIN: 1 ♂, Madison, May 14 1936, (F. M. Snyder), *type*, [Univ. Wisc.].

Pegomyia caesia Stein

Pegomyia caesia Stein, Wien. Ent. Zeitg., 1906, XXV, p. 78. Stein, Arch. f. Naturgesch., (1913), LXXIX, (A), hft. 8, p. 36, 1914. Stein, Arch. f. Naturgesch., (1915), LXXXI, (A), hft. 10, p. 126, 1916. Karl, Tierwelt Deutschlands, XIII, pt. 3, p. 140, 1928. Séguy, Gen. Insect., fasc. 205, p. 53, 1937.

Pegomyia (*Pegomyia*) *caesia* Séguy, Faune de France, VI, p. 158, 1923. Ringdahl, Ent. Tidskr., LIX, hft. 3–4, p. 200, 1938.

I have tentatively concluded that the series of female specimens listed below belong to *P. caesia* Stein, a male specimen of which was kindly furnished me by Mr. Ringdahl for comparative study.

[38] Kindly identified by Dr. K. M. Wiegand, Cornell University.

[39] Hendel F. Neue europäische Minierfliegen. (8. Beitrag zur Blattminenkunde Europas). *Konowia*, IV, heft 5, p. 304, 1925.

The species does not fall readily into any of the lesser segregates into which I have divided the genus. The male has the habitus of the *hyoscyami*-subgroup, but this is apparently not so in the female which has a strong pair of cruciate bristles and stiffly chitinized polished sclerites on ovipositor. The species has three pairs of well developed presutural acrostical bristles in series which are not close to one another. The middle pair of presutural acrostical bristles is nearly as long as the first pair of dorsocentral bristles. The thorax is entirely blackish and abdomen reddish yellow, including the processes of male. Parafacials and cheeks are not extensively broadened when viewed in profile, the latter being slightly narrower caudad.

ALBERTA: 1 ♀, Banff, June 24 1922; 1 ♀, July 6 1922, (C. B. D. Garrett), [C. N. C.]. 1 ♀, Edmonton, June 10 1937, (E. H. Strickland), [Univ. Alberta].

BRITISH COLUMBIA: 1 ♀, Keremeos, June 17 1923; 3 ♀, June 21 1923; 2 ♀, June 25 1923, (C. B. D. Garrett), [C. N. C.].

Pegomyia alticola Huckett

Pegomyia alticola Huckett, Trans. Amer. Ent. Soc., LXV, p. 25, 1939.

The species *alticola* differs from any known to me as belonging to the genus on account of the peculiar pair of accessory sclerites adjoining the fifth sternum in male, from which arise a prominent series of curved bristles. In the female the fore tibiae are conspicuously infuscated and each has two fine posteroventral bristles.

ALASKA: 1 ♀, Savonoski, Naknek Lake, June 1919, (J. S. Hine), *allotype*, [A. N. S. P.].

UTAH: 1 ♂, Uintah Mountains, Mirror Lake, no date, *type*, [A. N. S. P.].

Pegomyia hyoscyami (Panzer)

Musca hyoscyami Panzer, Faun. Germ., CVIII, p. 13, 1809.

Pegomyia hyoscyami Robineau-Desvoidy, Essai Myod., p. 598, 1830. Stein, Wien. Ent. Zeitg., XXV, p. 94, 1906. Schnabl, Hor. Soc. Ent. Ross., XXXIX, p. 8, 9, 1910. Schnabl, Deutsch. Ent. Zeitschr., hft. 6, p. 82, 1911. Stein, Arch. f. Naturgesch., (1913), LXXIX, (A), hft. 8, p. 35, 1914. Stein, Arch. f. Naturgesch., (1915), LXXXI, (A), hft. 10, p. 124, 1916. Malloch, Trans. Amer. Ent. Soc., XLIV, p. 300, 1918. Britton, Bull. 31, Conn. Geol. Nat. Hist. Surv., p. 199, 1920. Malloch, Bull. Brooklyn Ent. Soc., XV, p. 123, 1920. Cole and Lovett, Proc. Cal. Acad. Sci., XI, p. 313, 1921. Huckett, Ann. Ent. Soc. Amer., XIV, p. 313,

1921. Huckett, Mem. 77, N. Y. (Cornell) Agr. Exp. Station, (1923), p. 110, 1924. Johnson, Occ. Pap. Boston Soc. Nat. Hist., VII, p. 232, 1925. Johnson, Insect. Fauna, Biol. Surv. Mt. Desert Region, p. 209, 1927. Ringdahl, Trømso Museums Årshefter, (1926), XLIX, no. 3, p. 32, 1928. Huckett, Mem. 101, N. Y. (Cornell) Agr. Exp. Station, (1926), p. 840, 1928. Karl, Tierwelt Deutschlands, XIII, pt. 3, p. 133, 1928. Séguy, Encycl. Entom., Dipt., VI, p. 80, 1932. Tiensuu, Acta Soc. Faun. Flor. Fennica, LVIII, no. 4, p. 28, 1935. Séguy, Gen. Insect., fasc. 205, p. 56, 1937.

Anthomyza conformis Zetterstedt, Dipt. Scand., IV, p. 1704, 1845. Siebke, Enum. Insect. Norveg., IV, p. 121, 1877.

Pegomyia vicina Lintner, 1st Ann. Rept. N. Y. State Ent., (1882), p. 209, 1883. Slosson, Ent. News, VIII, p. 239, 1897. Aldrich, Misc. Coll. Smithsn. Inst., XLVI, no. 1444, p. 558, 1905. Smith, Ann. Rept. N. J. State Museum 1909, p. 792, 1910. Stein, Arch. f. Naturgesch., (1917), LXXXIII, (A), hft. 1, p. 149, 1919.

Pegomyia (*Pegomyia*) *hyoscyami* Schnabl and Dziedzicki, Abh. K. Leop.-Carol. Deutsch. Akad. Naturforsch., XCV, nr. 2, p. 112, 1911. Séguy, Faune de France, VI, p. 160, 1923. Ringdahl, Ent. Tidskr., LIX, hft. 3–4, p. 198, 1938.

The larvae of the species *hyoscyami* are commonly found mining the leaves of spinach, beets, swiss chard, mangolds, Dianthus, and several weeds including *Arctium lappa*, *Chenopodium album*, *Atriplex hastata*. Color differences in the adults emerging from larval rearings from various host plants have given rise to numerous varietal names, but I have as yet been unable to recognize these forms from specimens occurring in North America. It is most probable that all species to be included in the subgroup *hyoscyami* will be found eventually to be leaf-miners. The adults of the species in this segregate are characterized by having the parafacials, parafrontals and cheeks boldly developed and maintained, the lower portion of occiput swollen, frequently the antennae are reduced in size and oral margin between vibrissae constricted, prealar bristle is weak or absent, and lower sternopleural bristle of caudal pair short, processes are weakly bristled and taper distad, in the female the ventral sclerites of ovipositor are broadly extended and densely clothed with minute setulae, hind tibia often with more than the customary pair of bristles on antero- and posterodorsal surfaces, costa bare on proximal half of lower surface.

The species *hyoscyami* resembles *carduorum*, *indicta* and *convergens*. In the two latter species all the femora are extensively

infuscated, and in *carduorum* the scutellum and calyptrae are yellowish tinged.

ALASKA: 1 ♀, Fairbanks, June 29 1921; 1 ♀, Seward, July 24 1921, [U. S. N. M.].

ALBERTA: 2 ♂, Lake Newell, June 9 1923, (Walter Carter); 1 ♂, Chin, June 7 1923, (H. L. Seamans), [C. N. C.]. 1 ♂, Lethbridge, August 7 1923; 2 ♀, Wetaskiwin, June 6 1937, (F. O. Morrison); 1 ♂, St. Paul, June 21 1938, (E. H. Strickland), [Univ. Alberta].

BRITISH COLUMBIA: 1 ♂, Keremeos, June 30 1923, (C. B. D. Garrett), [C. N. C.].

CALIFORNIA: 1 ♀, Downey, September 27 1933; 1 ♂, Millbrae, San Mateo County, February 20, [A. N. S. P.].

INDIANA: 2 ♂, 4 ♀, Lafayette, reared from *Chenopodium*, (J. J. Davis), [U. S. N. M.].

MASSACHUSETTS: 1 ♂, Edgartown, June 29 1912.

MINNESOTA: 1 ♂, St. Paul, April 24 1921, (P. Keene).

NEW YORK: 4 ♂, 2 ♀, Elmont, Long Island, May 16 1921; 4 ♂, 3 ♀, Riverhead, Long Island, July 4 1935, *ex Chenopodium album:* 2 ♂, 2 ♀, Orient, Long Island, June 6 1936, *ex Atriplex hastata:* 1 ♀, Ithaca, August 25 1920, *ex* beet leaves, [H. C H.].

ONTARIO: 1 ♀, Burlington, August 9 1919, [H. C. H.]. 1 ♀, Binville, July 30 1913, (W. A. Ross), [C. N. C.].

QUEBEC: 1 ♂, Lake Lachine, June 10 1926, (F. P. Ide), [C. N. C.].

UTAH: 1 ♂, Saratoga, July 23 1929; 1 ♀, Hooper, April 23 1934, (G. F. Knowlton); 1 ♂, Fort Duchesne, July 9 1931, (R. L. Jane), [Utah Agr. Col.].

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Dorsal or caudal aspect of male copulatory appendages

Fig. 1.—*Pegomyia palposa* (Stein)

Fig. 2.—*Pegomyia intersecta* (Meigen)

Fig. 3.—*Pegomyia unguiculata* Malloch

Fig. 4.—*Pegomyia littoralis* Malloch

Fig. 5.—*Pegomyia nigroscutellata* (Stein)

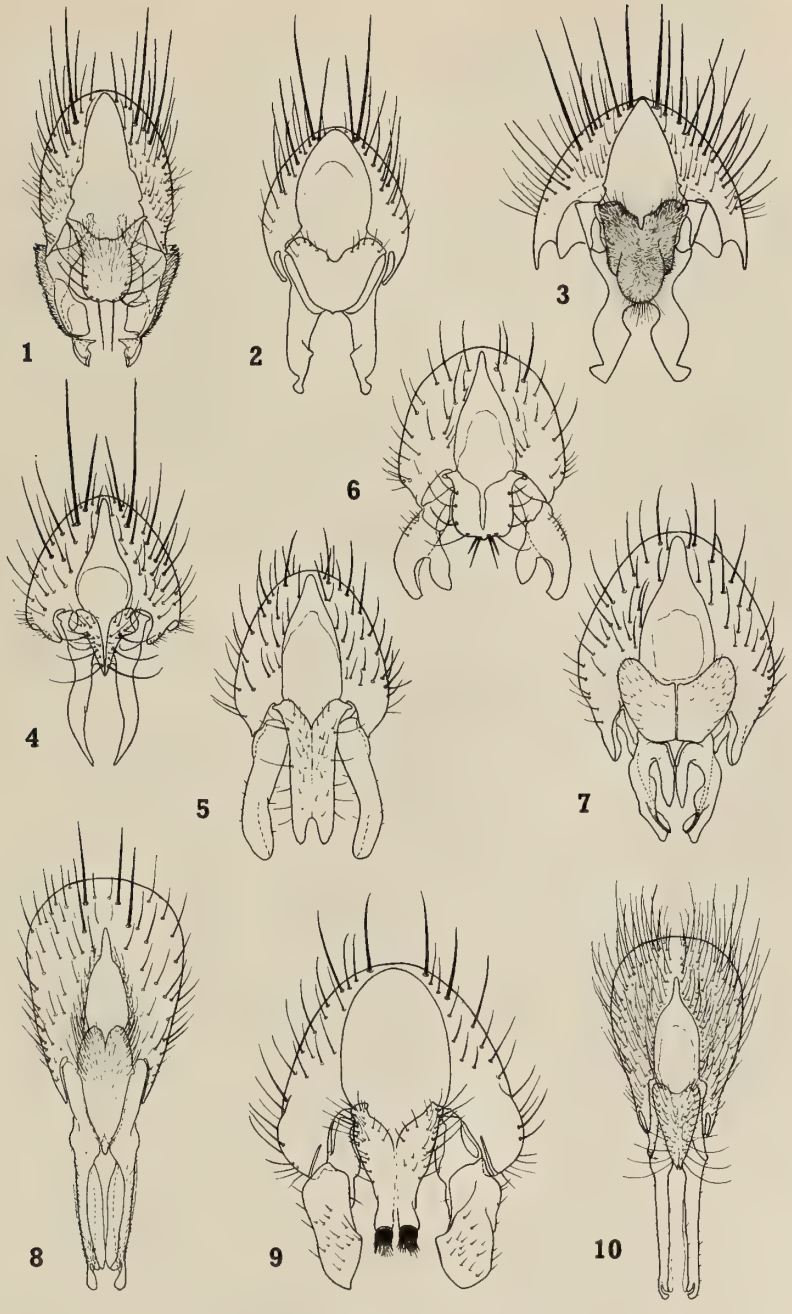
Fig. 6.—*Pegomyia pseudodissecta* (Ringdahl)

Fig. 7.—*Pegomyia glabra* (Stein)

Fig. 8.—*Pegomyia incompleta* (Stein)

Fig. 9.—*Pegomyia acutipennis* Malloch

Fig. 10.—*Pegomyia major* (Malloch)



HUCKETT—PEGOMYIA

Plate II

Dorsal or caudal aspect of male copulatory appendages.

Fig. 11.—*Pegomyia quadrispinosa* (Malloch)

Fig. 12.—*Pegomyia substriatella* (Malloch)

Fig. 13.—*Pegomyia apicalis* (Stein)

Fig. 14.—*Pegomyia duplicata* (Malloch)

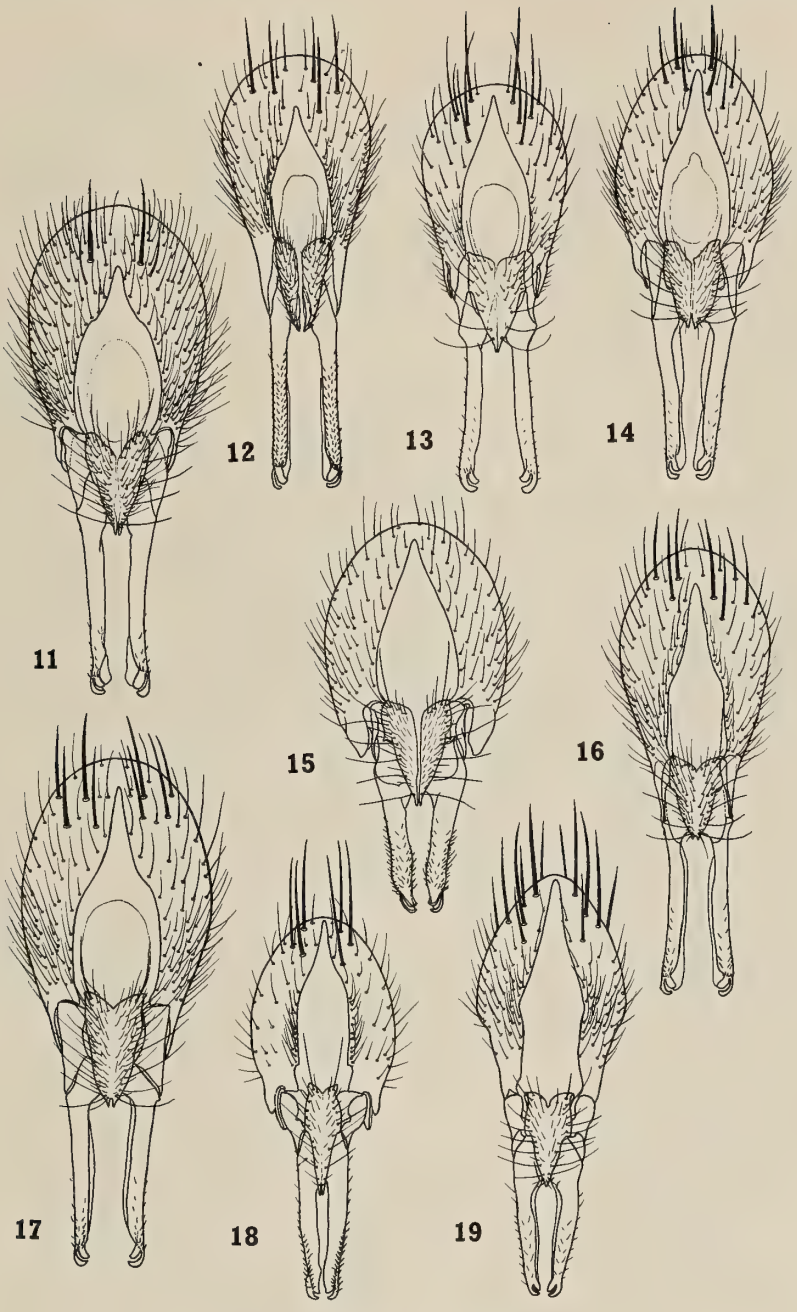
Fig. 15.—*Pegomyia frigida* (Zetterstedt)

Fig. 16.—*Pegomyia tarsata* (van der Wulp)

Fig. 17.—*Pegomyia longimana* (Pokorny)

Fig. 18.—*Pegomyia spinigerella* Malloch

Fig. 19.—*Pegomyia gopheri* Johnson



HUCKETT—PEGOMYIA

Plate III

Dorsal or caudal aspect of male copulatory appendages.

Fig. 20.—*Pegomyia flavifrons* (Walker)

Fig. 21.—*Pegomyia cognata* Stein

Fig. 22.—*Pegomyia ruficeps* Stein

Fig. 23.—*Pegomyia setaria* (Meigen)

Fig. 24.—*Pegomyia triseta* Malloch

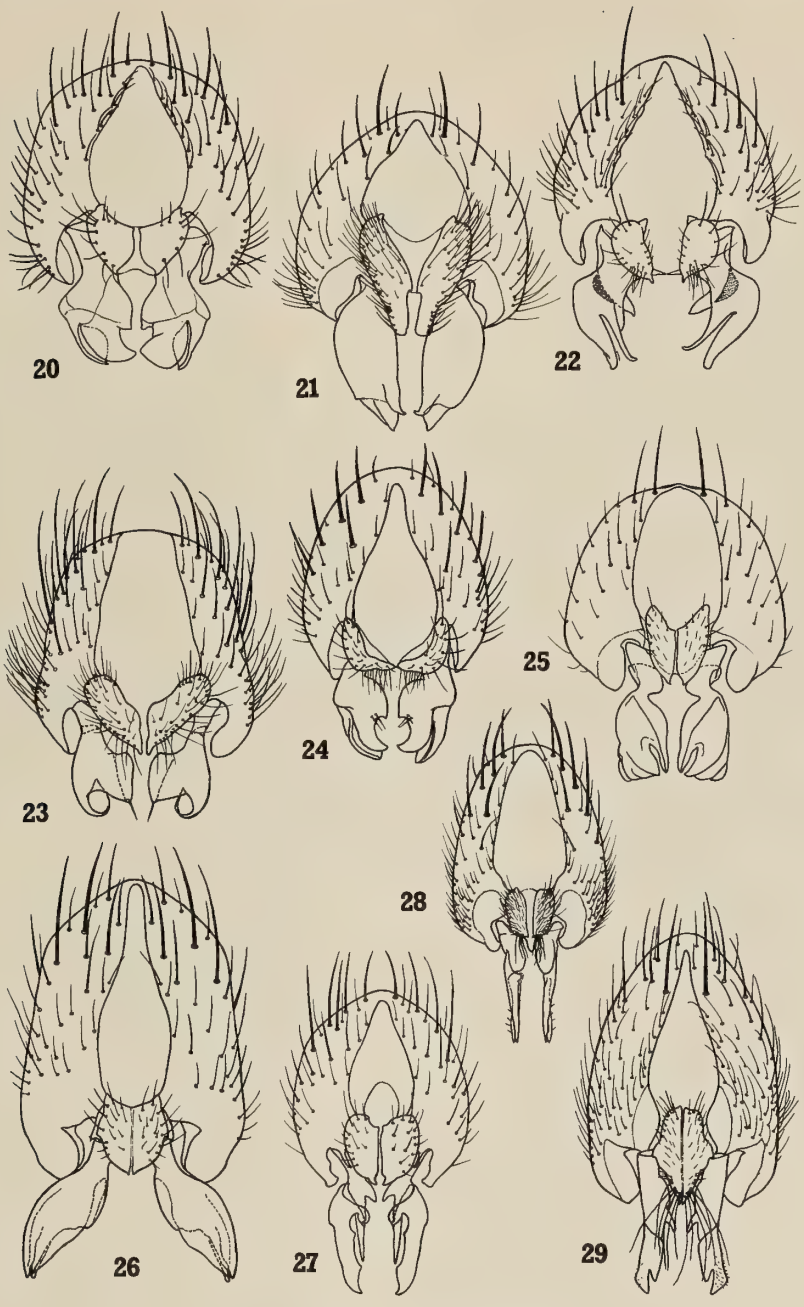
Fig. 25.—*Pegomyia flavipalpis* (Zetterstedt)

Fig. 26.—*Pegomyia univittata* (von Roser)

Fig. 27.—*Pegomyia unicolor* Stein

Fig. 28.—*Pegomyia incisiva* Stein

Fig. 29.—*Pegomyia pilosa* Stein



HUCKETT—PEGOMYIA

Plate IV

Lateral aspect of male copulatory appendages.

Fig. 30.—*Pegomyia palposa* (Stein)

Fig. 31.—*Pegomyia intersecta* (Meigen)

Fig. 32.—*Pegomyia unguiculata* Malloch

Fig. 33.—*Pegomyia littoralis* Malloch

Fig. 34.—*Pegomyia pseudodissecta* (Ringdahl)

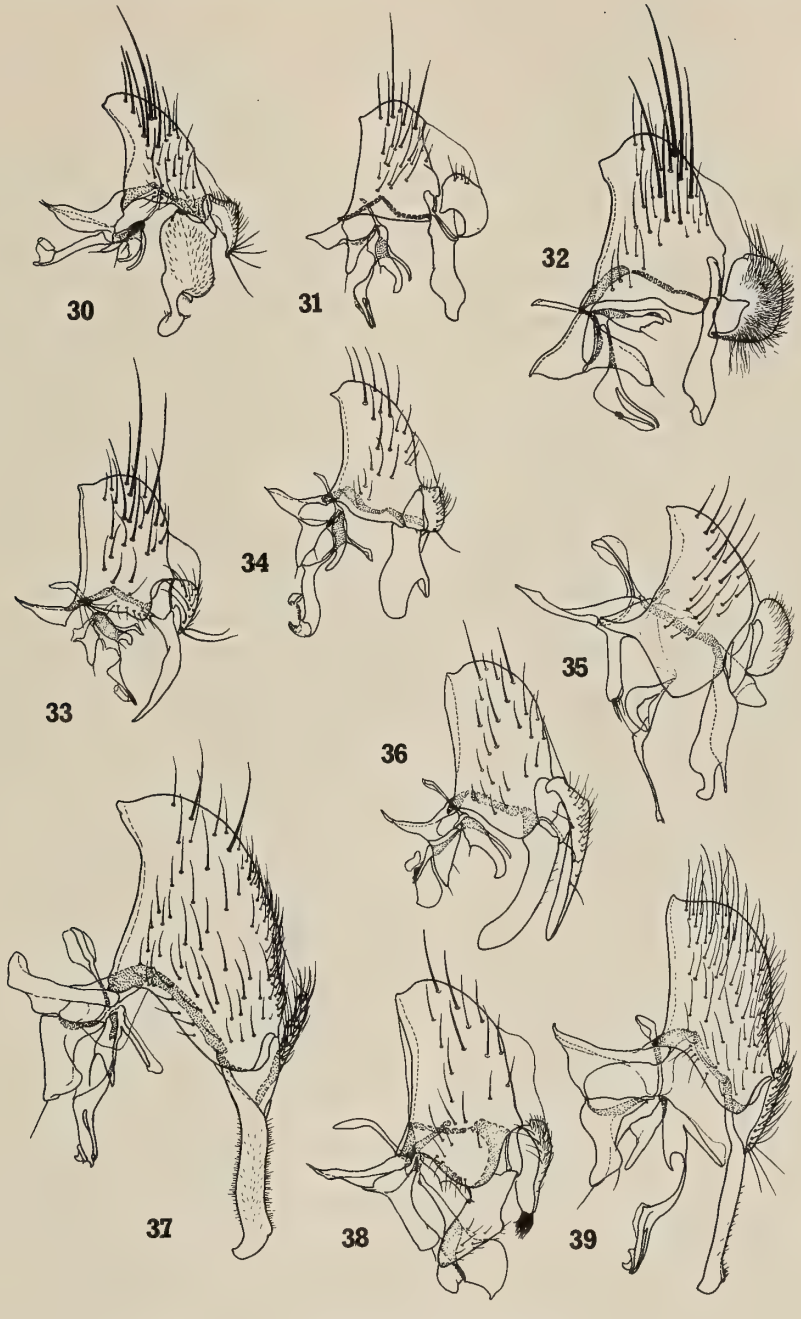
Fig. 35.—*Pegomyia glabra* (Stein)

Fig. 36.—*Pegomyia nigroscutellata* (Stein)

Fig. 37.—*Pegomyia incompleta* (Stein)

Fig. 38.—*Pegomyia acutipennis* Malloch

Fig. 39.—*Pegomyia major* (Malloch)



HUCKETT—PEGOMYIA

Plate V

Lateral aspect of male copulatory appendages.

Fig. 40.—*Pegomyia quadrispinosa* (Malloch)

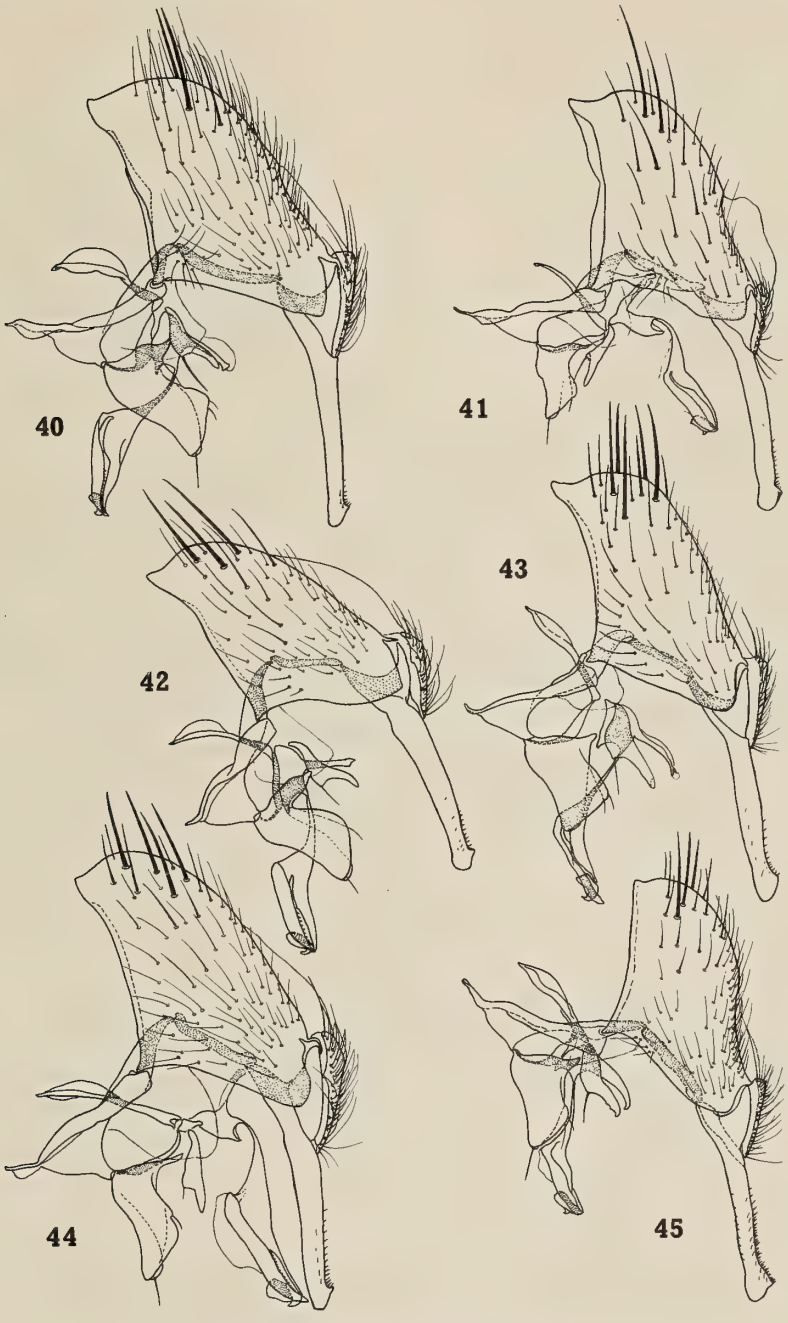
Fig. 41.—*Pegomyia apicalis* (Stein)

Fig. 42.—*Pegomyia duplicata* (Malloch)

Fig. 43.—*Pegomyia tarsata* (van der Wulp)

Fig. 44.—*Pegomyia longimana* (Pokorny)

Fig. 45.—*Pegomyia substriatella* (Malloch)



HUCKETT—PEGOMYIA

Plate VI

Lateral aspect of male copulatory appendages.

Fig. 46.—*Pegomyia frigida* (Zetterstedt)

Fig. 47.—*Pegomyia spinigerella* Malloch

Fig. 48.—*Pegomyia gopheri* Johnson

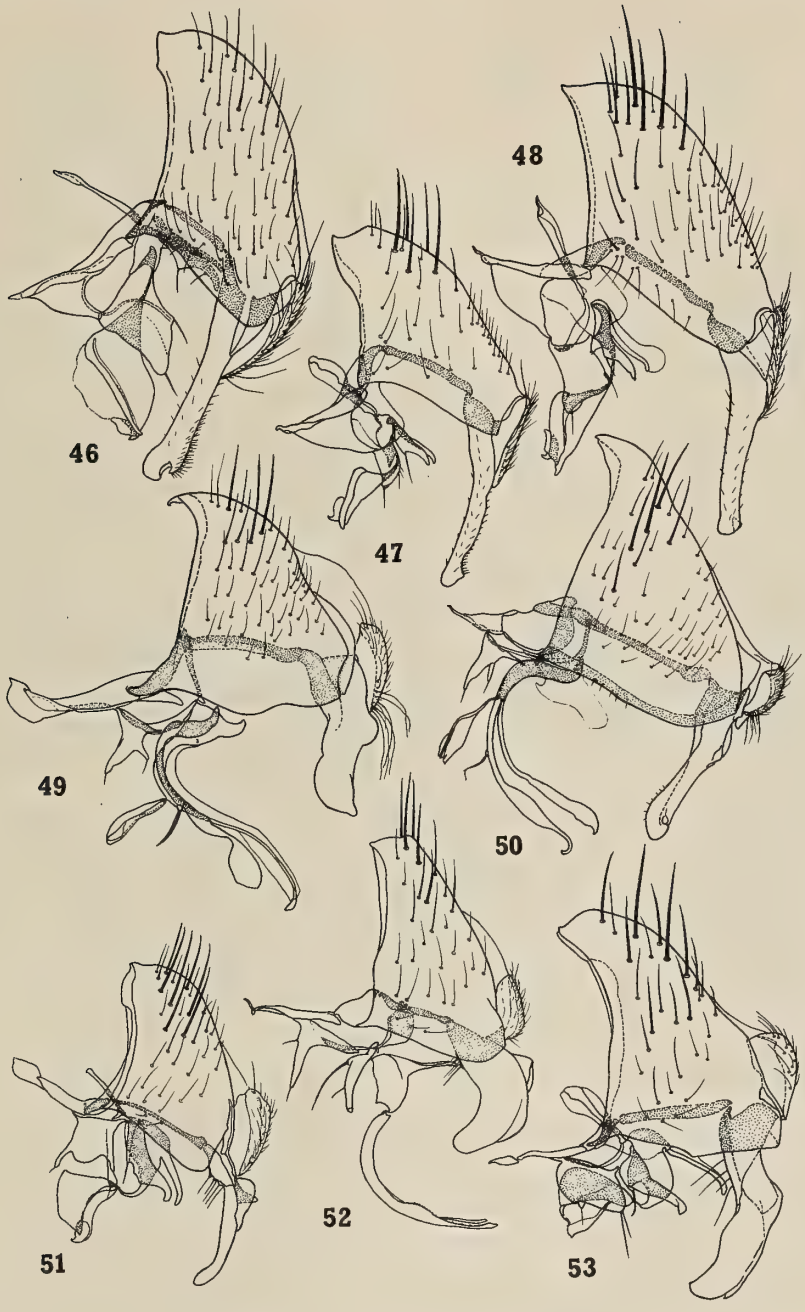
Fig. 49.—*Pegomyia pilosa* Stein

Fig. 50.—*Pegomyia incisiva* Stein

Fig. 51.—*Pegomyia unicolor* Stein

Fig. 52.—*Pegomyia flavipalpis* (Zetterstedt)

Fig. 53.—*Pegomyia univittata* (von Roser)



HUCKETT—PEGOMYIA

Plate VII

Ventral aspect of fifth abdominal sternum in male.

Fig. 54.—*Pegomyia palposa* (Stein)

Fig. 55.—*Pegomyia intersecta* (Meigen)

Fig. 56.—*Pegomyia unguiculata* Malloch

Fig. 57.—*Pegomyia littoralis* Malloch

Fig. 58.—*Pegomyia glabra* (Stein)

Fig. 59.—*Pegomyia acutipennis* Malloch

Fig. 60.—*Pegomyia nigroscutellata* (Stein)

Fig. 61.—*Pegomyia dissecta* (Meigen)

Fig. 62.—*Pegomyia pseudodissecta* (Ringdahl)

Fig. 63.—*Pegomyia vanduzeei* Malloch

Fig. 64.—*Pegomyia incisiva* Stein

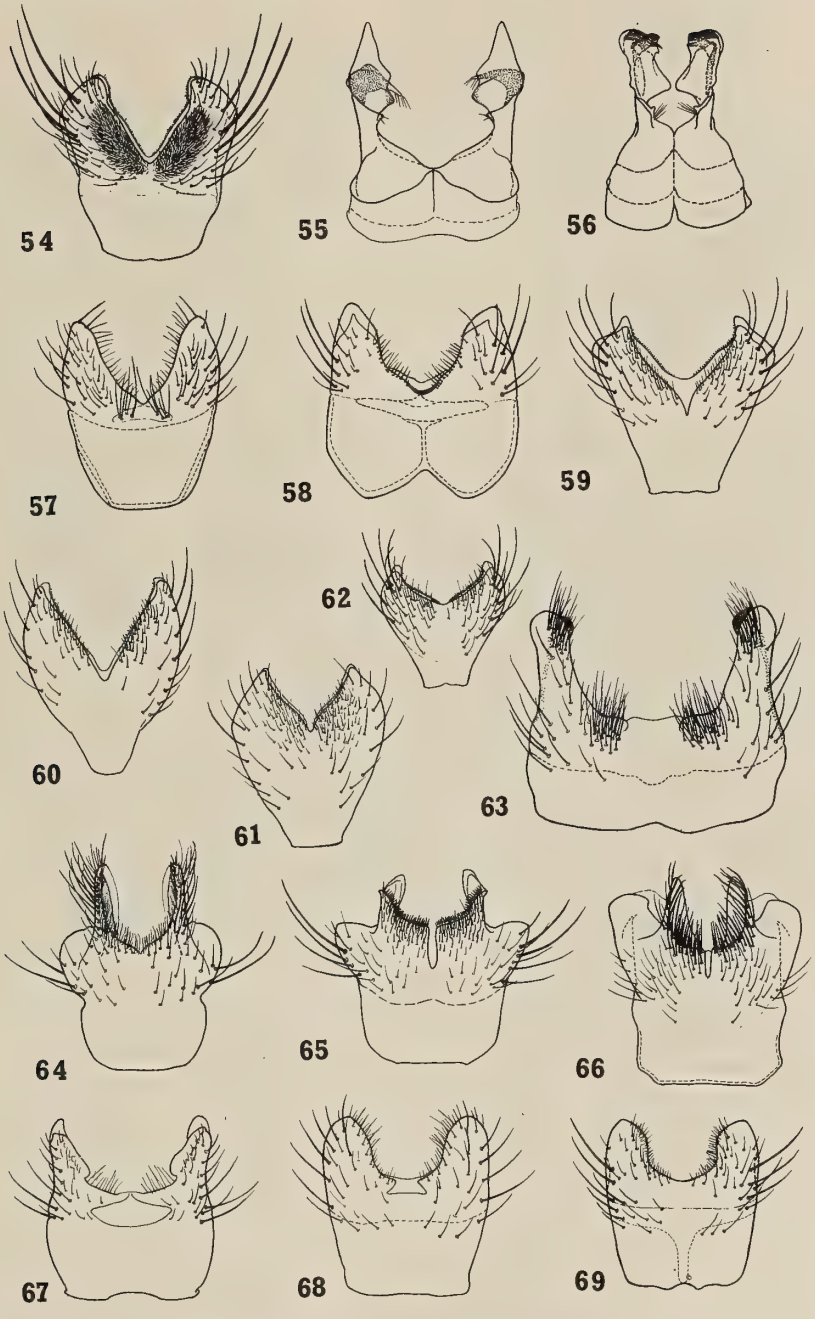
Fig. 65.—*Pegomyia pilosa* Stein

Fig. 66.—*Pegomyia gilva* (Zetterstedt)

Fig. 67.—*Pegomyia unicolor* Stein

Fig. 68.—*Pegomyia flavipalpis* (Zetterstedt)

Fig. 69.—*Pegomyia univittata* (von Roser)



HUCKETT—PEGOMYIA

Plate VIII

Ventral aspect of fifth abdominal sternum in male.

Fig. 70.—*Pegomyia incompleta* (Stein)

Fig. 71.—*Pegomyia major* (Malloch)

Fig. 72.—*Pegomyia quadrispinosa* (Malloch)

Fig. 73.—*Pegomyia substriatella* (Malloch)

Fig. 74.—*Pegomyia apicalis* (Stein)

Fig. 75.—*Pegomyia duplicata* (Malloch)

Fig. 76.—*Pegomyia tarsata* (van der Wulp)

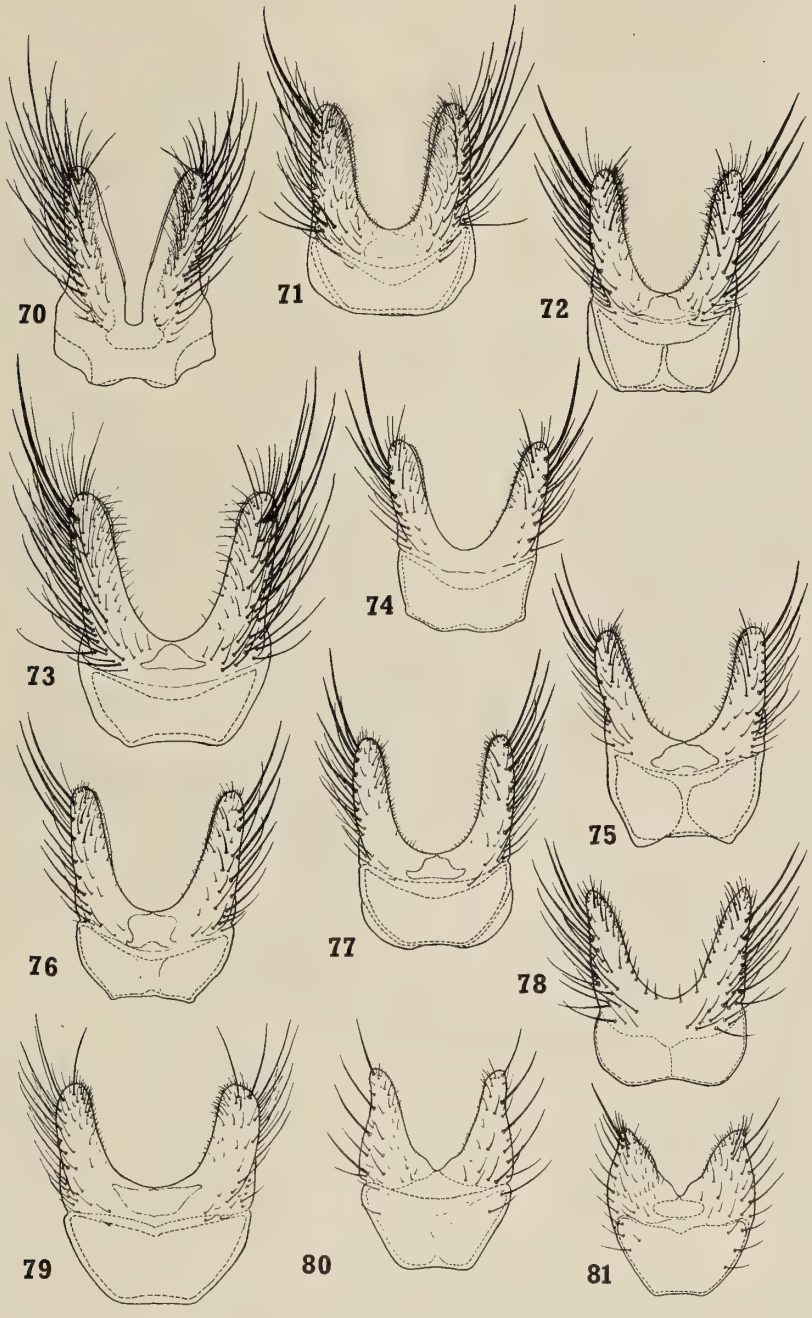
Fig. 77.—*Pegomyia longimana* (Pokorny)

Fig. 78.—*Pegomyia lipsia* (Walker)

Fig. 79.—*Pegomyia frigida* (Zetterstedt)

Fig. 80.—*Pegomyia gopheri* Johnson

Fig. 81.—*Pegomyia spinigerella* Malloch



HUCKETT—PEGOMYIA

Plate IX

Lateral aspect of male copulatory appendages.

Fig. 82.—*Pegomyia cognata* Stein

Fig. 83.—*Pegomyia flavifrons* (Walker)

Fig. 84.—*Pegomyia ruficeps* Stein

Fig. 85.—*Pegomyia setaria* (Meigen)

Fig. 86.—*Pegomyia triseta* Malloch

Ventral aspect of fifth abdominal sternum in male.

Fig. 87.—*Pegomyia flavifrons* (Walker)

Fig. 88.—*Pegomyia ruficeps* Stein

Fig. 89.—*Pegomyia cognata* Stein

Fig. 90.—*Pegomyia bicolor* (Wiedemann)

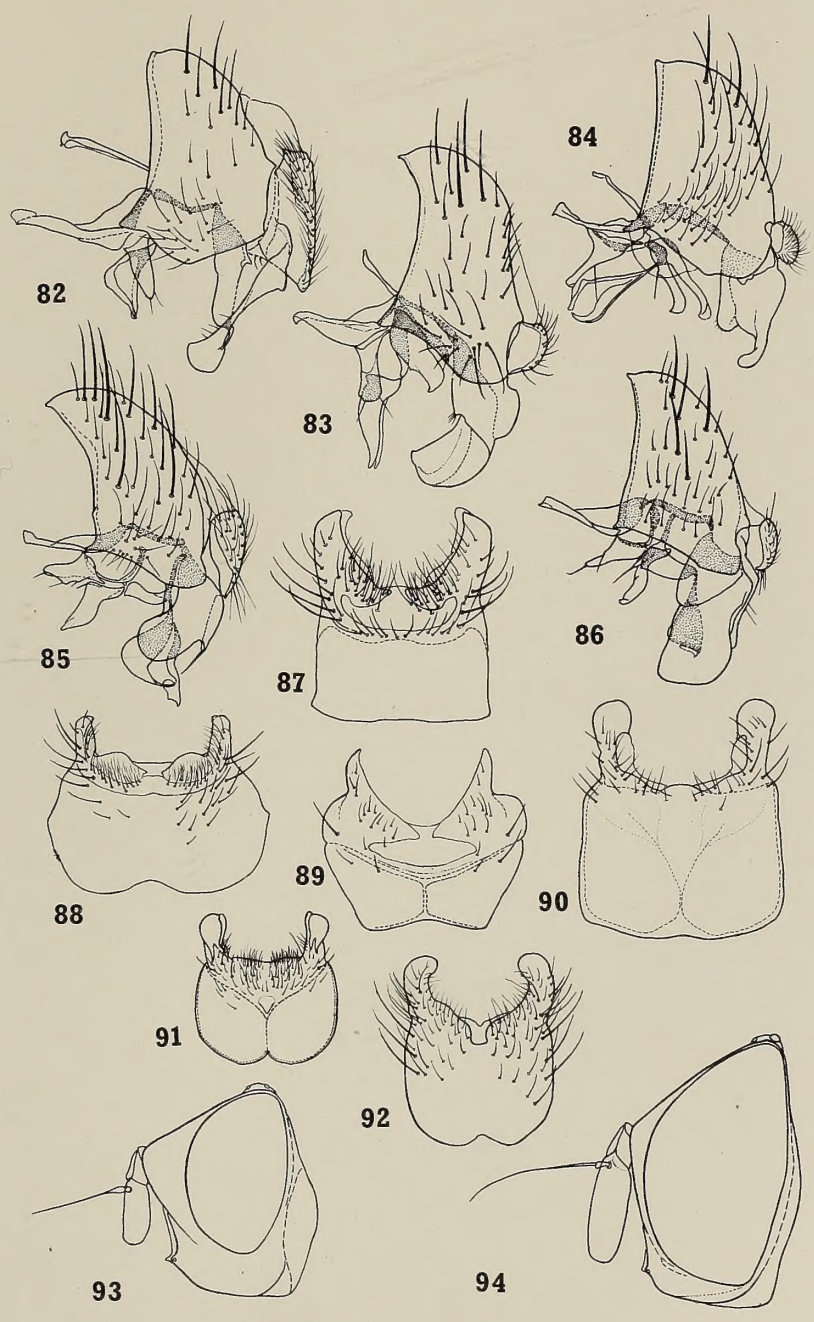
Fig. 91.—*Pegomyia triseta* Malloch

Fig. 92.—*Pegomyia setaria* (Meigen)

Lateral aspect of male head.

Fig. 93.—*Pegomyia hyoscyami* (Panzer)

Fig. 94.—*Pegomyia geniculata* (Bouché)



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